



**A NEW COURSE
EASA'S ROADMAP:
A LIFT AT LAST FOR
LIGHT AIRCRAFT?**
GA SPECIAL P20

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Airbus pursues troubled
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FLIGHT

INTERNATIONAL

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31 MARCH-6 APRIL 2015

FLIGHT TEST

WOODEN WONDER

Robin's repowered diesel
delivers economy class



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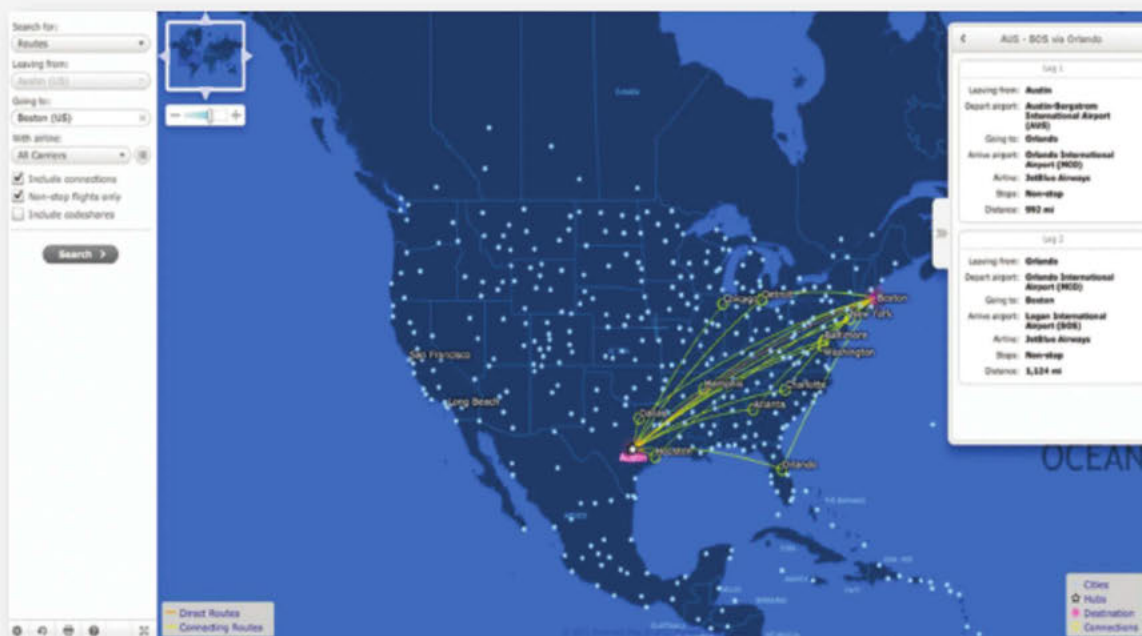


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COVER IMAGE

This image, taken by BillyPix, shows a Robin DR401 four-seat, wooden piston single being flown by our flight test pilot, Peter Collins **P25**



BEHIND THE HEADLINES

Kate Sarsfield attended the annual **British Business and General Aviation Association** conference in London, where delegates discussed some of the major **challenges** facing this **niche community** in Europe – not least a worrying decline in private flying (**P20**)



NEXT WEEK LAAD

Ahead of its defence show we focus on Brazil's big military aviation procurements and emerging supply chain

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Improved turbine engine competition heats up **P15**. Germanwings CVR suggests deliberate destruction **P7**

Download the new **Commercial Engines Report**
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flightglobal.com/commengines



IMAGE OF THE WEEK

Leasing company Avolon delivered the first of four Boeing 787-9s on order for Virgin Atlantic on 23 March. Flightglobal's Ascend Fleets database shows Virgin's Boeing fleet as consisting of four 787-9s already in service, with 13 on order and options for seven more, as well as 12 747-400s

View more great aviation shots online and in our weekly tablet edition:



THE WEEK IN NUMBERS

20%

The growth in available seat miles that Frontier Airlines reckons is sustainable, given US airlines consolidation

Flightglobal dashboard

\$470m

The value to Orbital ATK of a NASA contract to build up to three weather satellites, for delivery from 2020

Orbital ATK

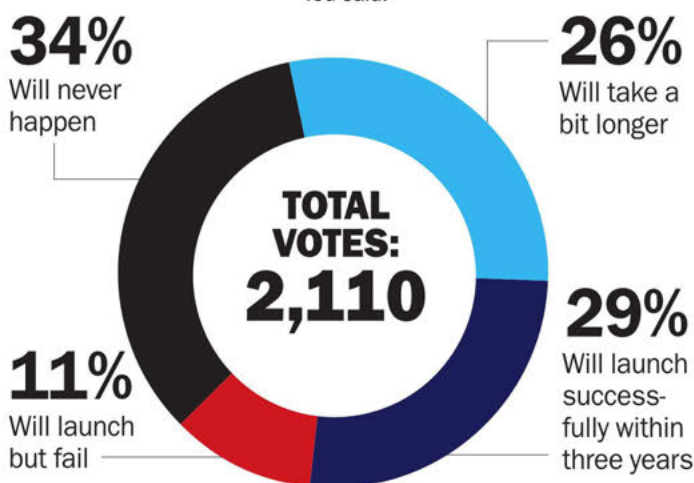
400

The number of new jobs to come to Casablanca with growth at Boeing-Safran joint venture MATIS Aerospace

Safran

QUESTION OF THE WEEK

Last week, we asked: **Ryanair's proposed transatlantic service:**
You said:



This week, we ask: **After the Germanwings loss the industry should:**

- ☐ Abandon locked cockpit doors
- ☐ Conduct regular psychological checks of pilots
- ☐ Take better care of its pilots

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CAE offers training centres, training services, and simulation products for helicopters.

A silent threat

Deliberate action by a pilot to destroy an aeroplane may be very rare, but it happens. Human factors in areas like this are immensely complex, but a careful study of the issue is needed

The Germanwings Airbus A320 loss, it seems, was another deliberate act by a pilot. That statement is not intended to imply that this is becoming commonplace – because that is far from true – but the very fact that there have been several deliberate acts of destruction by pilots, even if over many years, makes it clear that the issue needs to be addressed.

Recent events in which a pilot suicide or revenge motive are either known or believed to have been present include the Linhas Aéreas de Mocambique Embraer 190 captain who, in November 2013, locked the co-pilot out of the cockpit and programmed the autopilot into a continuous descent remarkably like the Germanwings case. In both cases the non-flying pilot was clamouring for access, but ignored. That is an official verdict in the published report. The disappearance of Malaysia Airlines MH370 is believed by most serious experts in the industry to have been a deliberate act by a captain

Pilots work in one of the most checked and tested of professions already

who had planned the action meticulously, but this is unproven and may remain so.

Earlier events include two where the results are disputed: the loss of an Egyptain Boeing 767 and of a Silk Air 737. The US National Transportation Safety Board says both were deliberate acts by pilots, but the Egyptian and Indonesian authorities disagree. There are others. The detail is rather less important than the simple fact that these events happened.

Psychologist James N Butcher, writing in the *International Journal of Selection and Assessment*, says:



Cockpits can too easily conceal emotional stress

“Personality and emotional factors have been found to impact [pilot] job performance; however, most airlines do little in the way of psychological assessment at the initial hiring stage or throughout the pilot’s career to detect potential personality problems or emotional disorders. Much is known about the personality and mental health factors that could affect performance of pilots, but little of this information has been incorporated in pilot screening programmes.”

The best existing system is simply for a company to have good employee relationships, and to agree with its pilot association a system of peer checking. Pilots who appear to be under stress are approached by their colleagues to see if they need help or advice.

Pilots work in one of the most checked and tested of professions. More checks might add to stress, which is harmful in itself. And things change quickly. A stable pilot one day can, after a family or career misfortune, be under severe stress the next. But improved assessment may be possible, so this needs careful study. ■

See This Week P7

The decline of the private pilot

It is a curious anomaly. At a time when more people than ever are flying as airline passengers, the number flying as private pilots is plummeting. UK Civil Aviation Authority figures show that flying activity at schools and aerodromes has fallen 40% since 2005. The pattern in other mature markets is similar, while in most of the fastest growing regions for airline travel, there is barely a recreational aviation sector to speak of.

The reasons for the decline in weekend flying are many: a loss of private aerodromes, many swallowed up for development; a decline in military-trained pilots; rising costs and changes in the way airlines recruit for the cockpit. Recreational fashions also move on.

Does it matter? Some fret that the falling number of

private pilots is contributing to a shortage of professional pilots – a ticking timebomb that will lead to airlines having to rein back on expansion plans because they will not have crews to fly their shiny new aircraft.

In truth, the correlation is tenuous. Carriers will simply invest in other methods to fill right-hand seats – notably multi-crew pilot licence training, where raw recruits who have never held a joystick can be moulded into capable first officers.

But it is sad that 112 years after the Wrights, when the aviation industry has never been more buoyant, the simple, solitary pleasure of piloting a tiny aircraft into the great blue beyond seems to be losing its allure. ■

See Feature P20



David Learmount offers his succinct views on the complexities of aviation safety
flightglobal.com/Learmount



BRIEFING

RYANAIR BACKTRACKS ON LONG-HAUL APPROVAL

STRATEGY Irish low-cost carrier Ryanair has dismissed suggestions that it will launch a transatlantic operation, issuing a stock market statement clarifying that the board of Ryanair Holdings has not considered or approved any such project, "and does not intend to do so". A recent round of media reports had stemmed from the airline's own comments about a potential long-haul operation, "dependent on attaining viable aircraft". The idea of a transatlantic operation was first floated by chief executive Michael O'Leary in April 2007.

CSERIES TIPPED FOR PARIS DEBUT

EVENT Paris air show managing director Gilles Fournier believes there is a "90% chance" that Bombardier's CSeries will be making a debut appearance at the 15-21 June event, but says the Lockheed Martin F-35 is not expected to make an appearance. "No US military aircraft will fly at the show," he says, while listing participants as to include the Airbus A350, Dassault Falcon 8X and Textron AirLand Scorpion. Russia has yet to request flying display slots for any of its aircraft, but government representatives have been invited.

HAINAN PLANS 787-9 PURCHASE

FLEET Chinese carrier Hainan Airlines plans to acquire 30 Boeing 787-9s, according to a disclosure to the Shanghai stock exchange. This refers to the signing of a purchase agreement that is to be submitted to a general meeting of its shareholders. The airline has previously ordered 10 General Electric GEnx-powered 787-8s.

MALAYSIA STARTS S-61 NURI TRANSFER

ROTORCRAFT The Royal Malaysian Air Force has handed over the first two of 12 Sikorsky S-61 "Nuri" utility helicopters to the nation's army, with the pair shown at the Langkawi International Maritime and Aerospace exhibition in mid-March. Sporting "digital" camouflage schemes, aircraft M23-01 and M23-31 were built in 1967 and 1978. They will be operated from Johor by the army's 881 Sqn.

ADAC CHIEF LANDS UK DEFENCE ROLE

APPOINTMENT Abu Dhabi Airports Company (ADAC) chief executive Tony Douglas is stepping down from his role to take the same title at the UK's Defence Equipment and Support organisation. Douglas, who joined ADAC in 2013, is to succeed Bernard Gray later this year.

BAE 146 GETS UNPAVED RUNWAY BOOST

OPERATIONS BAE Systems has received certification allowing the BAe 146-100 and -200 to carry up to 4t more payload or fly up to 700nm (1,300km) further when operating on unpaved airstrips. This follows a two-year project with Cobham Aviation Services Australia to collect acceleration data during flights from Perth to Kambalda.

INDIAN NAVY LOSES MARITIME PATROL DORNIER

ACCIDENT The Indian navy has lost its first Hindustan Aeronautics-built Dornier 228 since introducing the type in the early 1990s. The maritime patrol aircraft was on a night training sortie on 24 March when it ditched at sea about 20nm (37km) southwest of Goa. One pilot was rescued, but the other two crew members were missing.

ARMED WARRIORS LAND IN AFGHANISTAN

DELIVERIES MD Helicopters has delivered the first six MD530F Cayuse Warrior armed scouts to the Afghan air force. They will be followed by a further six by mid-year, and a final five by early 2016.



US Marine Corps

Targeting software gets confused in a three-aircraft formation

SCHEDULE STEPHEN TRIMBLE WASHINGTON DC

Marines hold firm on F-35B schedule

Lead Joint Strike Fighter user will declare type operational in July, despite capability, airframe and support challenges

The US Marine Corps has decided to stand up its first operational Lockheed Martin F-35B squadron in July, says Lt Gen Christopher Bogdan, executive officer of the Joint Program Office overseeing the project, adding that known software, structural and logistical issues will be fixed later.

The decision, announced on 24 March, means the first F-35B unit will achieve initial operational capability (IOC) on time in the fourth quarter of fiscal year 2015 – but with some operational restrictions, workarounds and the possibility of an internal redesign of a critical bulkhead.

In 2010, the USMC accepted that the first operational squadron of the short take-off and vertical landing (STOVL) model would enter service in 2015 with a less capable version of software than that demanded by the US Air Force for the F-35A and the US Navy for the F-35C.

The F-35's Block 2B software will be incomplete at the time of the Marines' IOC declaration. While it performs basic flight control functions well, testing has shown that its algorithms become confused when three or four aircraft are sharing data about the same target, Bogdan says. Each aircraft senses the target's location and characteristics

slightly differently, and the algorithms are unable to determine whether one or more target exists. A completed version of the software that fixes the problem should be available by October.

F-35B pilots have learned to use various workarounds, Bogdan says. Four-aircraft formations can be broken down into groups of two aircraft, where sensor algorithms have proven more reliable.

Bogdan also says he is concerned about the integrity of the F-35B's aluminium 496 bulkhead, which bears critical structural loads where the trailing edge of the wing attaches to the aft fuselage. In 2004, programme officials reduced the weight of the STOVL variant by about 1,360kg (3,000lb), with changes including switching the bulkhead material from titanium to aluminium. The lighter-weight design has proven susceptible to structural cracking, requiring a series of "patches", and a redesign may be necessary.

Lockheed's autonomous logistics information system is also not ready to support a growing fleet of operational and test aircraft, Bogdan says. It will take several years to resolve this, and until then F-35B maintenance engineers will have to use workarounds to inspect and repair the aircraft. ■

See Defence P15



INQUIRY DAVID LEARMOUNT LONDON

Germanwings A320 crash 'deliberate'

Co-pilot dialled low altitude into autopilot and remained silent as captain tried in vain to re-enter cockpit, say investigators

French investigators of the Germanwings Airbus A320 crash in the French Alps say the cockpit voice recorder makes it clear that the aircraft commander was out of the cockpit when the aircraft began a steady descent from its 38,000ft cruise level, and for the remaining time until impact.

The sound of the captain beating on the secure cockpit door was recorded, but accident investigation agency BEA says there was no response of any kind from the co-pilot, who had dialled a low altitude into the autopilot controls, and pressed the execute button to begin the fatal descent. This action cannot, it notes, be carried out automatically.



D-AIPX was flying from Barcelona to Düsseldorf when it crashed into the French Alps at high speed

Registered as D-AIPX, the A320 had taken off from Barcelona, Spain at 10:00 local time for flight 4U9525 to Düsseldorf, Germany on 24 March carrying 144 passengers and six crew. No-one survived the impact, which took

place at high speed in a mountainous ravine near the French alpine town of Barcelonnette.

The judicial prosecutor – who in France always works in parallel with the accident investigators – says the co-pilot's act of flying

the aircraft into the ground appears deliberate.

The aircraft's flight data recorder had yet to be recovered as *Flight International* went to press, but flight profile information available shortly after the crash indicated that it levelled out at the cleared cruising altitude for less than 3min before the descent began. Its cruise speed of 420-460kt (777-833km/h) was maintained fairly steadily throughout the continuous descent, the rate of which averaged about 4,000ft/min for the 8min before impact with mountains at approximately 5,000ft. That rate of descent would not be unusual for an expedited descent on a normal flight.

The BEA's chief investigator says the last communication with the aircraft was a normal acknowledgement by the pilot of clearance to the next reporting point, with the descent having begun moments later.

During the descent, Marseille air traffic control called the Germanwings flight several times but the co-pilot did not reply to any of the calls. The chief investigator says the co-pilot's normal breathing could be heard throughout the fatal descent.

Airbus says the A320 destroyed in the crash – airframe MSN147 – had accumulated 58,300h in roughly 46,700 flights since its delivery to Germanwings' parent company Lufthansa in 1991. It has not given any information about the aircraft's maintenance record. ■

DATA DAVID LEARMOUNT LONDON

Rarity of incidents during cruise phase raised early red flags

The 24 March crash of Germanwings-operated Airbus A320 D-AIPX immediately stood out as an unusual event, as whatever precipitated the loss occurred in the brief cruise phase of the flight.

It is extremely rare for a modern short-haul airliner to develop problems the crew cannot cope with during the cruise. By far the majority of serious accidents have their origins in, or occur during, approach

and landing or take-off and climb.

Information from Flightglobal's Ascend Fleets database shows that, since the first A320 entered service in 1988, there have been 31 fatal accidents involving civilian jet airliners caused by circumstances arising during the cruise.

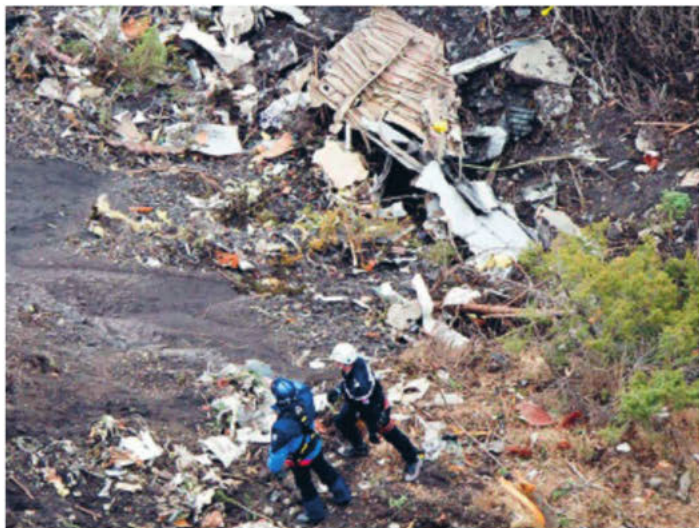
Only two of these involved an A320-series aircraft, with the other having been the Indonesia AirAsia example that was lost in stormy

weather over the Java Sea on 28 December 2014.

The most common causes of cruise-phase accidents are encounters with unusual weather conditions and technical or structural failure. There have been seven losses in each of these categories, with technical issues ranging from failure of aircraft pressurisation, engines, avionics, mechanical systems, and structural or component failure owing to metal fatigue.

Onboard fire and known or suspected pilot suicide accounted for four losses each. The most recent prior example of the latter – in November 2013 – involved a Linhas Aéreas de Mocambique Embraer 190 en route from Maputo to Luanda. In this case, when the co-pilot was out of the cockpit the captain locked the flightdeck door and carried out a controlled descent to impact.

Unforced crew errors resulted in another three of the crashes, and there were two occurrences of mid-air collision and two shoot-downs – one of which was accidental and the other deliberate. Finally, there was one case of controlled flight into high terrain while en route. ■



None of the 144 passengers and six crew on the aircraft survived



TEAMS BETH STEVENSON LONDON

Apache, Shadow units combine for US Army first

The US Army on 16 March established its first manned-unmanned teaming (MUM-T) squadron, combining Boeing AH-64D/E Apache attack helicopters with Textron Systems RQ-7B Shadow unmanned air vehicles in one heavy attack-reconnaissance unit. Based at Fort Bliss, Texas, the 3rd Squadron, 6th Cavalry Regiment, or 3-6, is part of the 1st Armoured Division's Combat Aviation Brigade.

Although the Apache and Shadow have previously demonstrated interoperability, having the two types under the same chain of command is the result of "years' worth of planning", the army says.

"It's an improved capability that supports soldiers on the ground as they execute the various missions that we assign them," says Lt Col RJ Garcia, commander of the 3-6 unit.

The Shadow is equipped with a tactical common datalink, which allows it to be operated alongside Apaches to fulfil the armed aerial scout role previously provided by the army's Bell Helicopter OH-58D Kiowa Warriors, which are due for retirement. AH-64 crews will also operate with General Atomics Aeronautical Systems MQ-1C Gray Eagle UAVs under the MUM-T framework.

Both UAV types can be commanded from the same universal ground control station, or by an Apache pilot. The latter link can range in scale from indirectly receiving payload data from an unmanned type to firing Lockheed Martin AGM-114 Hellfire missiles from the Gray Eagle and managing the aircraft's launch and recovery phases.

Final training for teamed operations by the unit is expected to finish by the end of May.

Meanwhile, the army has made a \$133 million contract modification to add 19 more Gray Eagle UAVs to an existing 19-unit order awarded to General Atomics in late 2013. Deliveries will conclude by May 2017. ■

UNMANNED SYSTEMS BETH STEVENSON LONDON

FAA delivery of test licence too slow for Amazon plans

Online retailer gets experimental airworthiness approval for aircraft innovation left behind

Experimental airworthiness certification has been awarded by the US Federal Aviation Administration to Amazon to test an unmanned air vehicle that could eventually be utilised for parcel delivery, although the online retailer says the design already "has become obsolete".

The company had been urging the FAA to authorise UAV testing since chief executive Jeff Bezos unveiled its Prime Air vision in December 2013. It was believed that the experimental allowance was a step in the right direction for Amazon, but just five days after the award, Paul Misener, its vice-president for global public policy, told the US Senate's subcommittee on aviation operations safety and security that while the permission was appreciated, the company has already developed more advanced unmanned air system technology and has been testing it elsewhere.

"We are grateful to the FAA for granting us permission to conduct UAS testing outdoors in the United States," Misener says. "However, the permission the FAA granted is more restrictive than are the rules and approvals by which we conduct outdoor testing in the UK and elsewhere. While the FAA was considering our applications for testing, we innovated so rapidly that the UAS approved by the FAA has become obsolete. We don't test it anymore."



Unveiled in December 2013, the Prime Air is already obsolete

Soon after the experimental certification was granted, Amazon asked the FAA for authorisation to fly "one of these advanced UAS in the United States", and

Misener says it hopes that this will be granted quickly.

Under the terms of the FAA award, Amazon was allowed to carry out research and development and crew training with an air vehicle flying at altitudes below 400ft, during daylight hours, and in visual meteorological conditions. The UAV pilot must also have a private pilot's certificate and medical certification – usually part of manned aviation guidelines, and Amazon would need to report its findings to the administration on a monthly basis. ■

MERGER EDWARD RUSSELL WASHINGTON DC

US carriers near single certification

American Airlines anticipates receiving a single operating certificate from the US Federal Aviation Administration on 8

April, it says. The development is a key step in the Fort Worth, Texas-based carrier's merger with US Airways.



Integration activity continues for American Airlines and US Airways

The majority of "flight, maintenance and dispatch procedures will be identical for all flights" under the certificate, American says in an employee newsletter, although some policies and procedures will remain separate while the remainder of its integration activity continues.

US Airways-operated flights will continue to carry both AA and US flight numbers until the airline moves to a single reservations system in the fourth quarter, it adds.

American and US Airways closed their merger in December 2013 and began codesharing a month later. ■



Airlines maintain
interest in aircraft-
inspection UAV
AIR TRANSPORT P10

MARKETS DAN THISDELL LONDON

Share sale proves Dassault's worth

Airbus left with just 25% equity in manufacturer of Rafale fighter as investment market responds well to capital offering

Airbus's 25 March move to offload a second tranche of its shareholding in Dassault Aviation has advanced its strategic plan to pare away non-core assets and underscored the attractiveness to investors of Dassault – a company whose shares have until now been essentially untraded.

The sale of 1.61 million shares amounted to about 17.5% of Dassault's share capital. Some 5% of the offer was bought by the company for €451 million (\$496 million), at a placement price of €980 for each of 461,000 shares. The remainder were taken by institutional investors for a small premium, at €1,030 each.

The transaction leaves Airbus with just shy of 25% of the company – down from 42% after a smaller sale last November and more than 46% historically. Groupe Dassault, parent company of the maker of the Rafale fighter and Falcon business jets, has 55.5% and Dassault Aviation itself just over 5.4%. The percentage of free floating shares now stands at 14.4%, up from just 1.9%. A further 120,000 shares may be sold if options are exercised by 24 April.

Ultimately, Airbus may conclude its divestment of Dassault this year, although it has agreed a

180-day lock-up for its remaining shares. Airbus Group chief strategy and marketing officer Marwan Lahoud says the sale advances its portfolio review, while "the strong demand from investors clearly shows the underlying quality of the Dassault Aviation business".

In the latest share sale, the French government opted not to exercise its right of first refusal. Should neither Dassault nor the French state participate in further Airbus sell-offs, the free float in Dassault Aviation shares could rise to as high as 39%, although Groupe Dassault would hold almost 59% of voting rights – a greater share than before Airbus began its disposal activity.

Airbus's longstanding 46% holding was inherited from its predecessor Aerospatiale as a legacy of a Francois Mitterrand-era attempt by the French government to nationalise Dassault. But while Airbus received a proportional share of Dassault's earnings, it had no control over the company, nor any great interest in influencing it. The two are rivals in the military sector, with the Rafale selected ahead of the Eurofighter Typhoon in an Indian fighter contest and also chosen for a recent 24-unit order from Egypt. ■



MBDA's Mica air-to-air missile has been integrated with the type

ENHANCEMENT CRAIG HOYLE LONDON

India accepts first upgraded Mirages

Dassault has handed over the first two Mirage 2000s to have been extensively upgraded for the Indian air force, with the conversion activity to now move to Hindustan Aeronautics in Bengaluru.

Modified by Dassault and Thales at Istres air base, the aircraft were accepted on 25 March. Originally built in the T and TH configurations, single-seat fighter KF107 and two-seat trainer KT201 are now redesignated as I/TI models.

New Delhi signed a \$2.4 billion upgrade deal for its Mirage 2000s in July 2011, and the lead pair were first returned to flight status in October and December 2013, respectively.

Key elements of the upgrade programme include a Thales RDY fire-control radar and digital cockpit avionics, and the integration of MBDA's Mica short/beyond-visual-range air-to-air missile.

Meanwhile, Dassault chief executive Eric Trappier says "exclusive negotiation is ongoing" linked to India's January 2012 selection of the Rafale for its 126-unit medium multirole combat aircraft deal.

"The Rafale will fulfil all of the operational requirements of the Indian air force and the industrial requirements of India's economic policy," he says, describing the type as "the next logical step" for the service. ■

PROGRAMME GREG WALDRON SINGAPORE

AVIC's prototype amphibian begins to take shape



The 9.5m-long forward fuselage section incorporates 5,200 parts

China's AVIC has completed the forward fuselage section for the first prototype of its AG600 amphibious aircraft, and expects to conduct the type's debut flight in early 2016.

Including the cockpit and nose landing gear bay, the structure is 9.5m (31.1ft) long and incorporates 5,200 separate parts, AVIC says. It will now be shipped from its Chengdu site to a China Aviation Industry General Aircraft factory in Zhuhai, where it will be mated with other sections. The aircraft's main fuselage, tail and

other large components are being built in Hanzhong, while its wing is being produced in Xian.

Firm orders for two AG600s were received at last year's Airshow China in Zhuhai, according to AVIC, with one source identifying the nation's coastguard as the customer.

Initially being developed for search and rescue and fire fighting applications, the AG600 should have a maximum take-off weight of 53,500kg (118,000lb) from a paved runway or calm water, or 49,800kg in rougher conditions. ■



The 777 crashed in July 2014

INQUIRY

TV show's MH17 claims rejected by investigators

Dutch investigators have stressed that the inquiry into the loss of Malaysia Airlines flight MH17 has not reached a formal conclusion, after a television network claimed an examination of fragments showed they came from a Russian weapon.

The network, RTL, commissioned an independent metallurgical analysis of fragments from the crash site in Ukraine, at least one of which carried Cyrillic markings – the alphabet used in both Russia and Ukraine.

It subsequently presented the findings as evidence that a Russian missile had brought down the Boeing 777-200ER on 17 July last year.

The Dutch Safety Board, which is leading the inquiry, says it had not previously been told about the fragments, nor endorsed the analysis. It says that the pieces, found in November, are due to be handed over to the investigation team shortly.

It states that its inquiry has not reached a final conclusion, pointing out that links to the aircraft's destruction have to be proven – particularly given that the region was subject to conflict – and that this process is “complex and time-consuming”.

Investigators are focusing on “many more sources than just the pieces of shrapnel”, says the Dutch Safety Board.

“Additional material for investigation is welcome for this, but it is important that it be irrefutably demonstrated that there is a relationship between any material and the aeroplane that crashed.” ■

MRO STEPHEN TRIMBLE MONTREAL

Airlines maintain interest in aircraft-inspection UAV

Unmanned quadcopter championed by EasyJet is attracting attention, says maker

Blue Bear Systems is in talks with more airlines besides EasyJet as it continues testing an unmanned air system as an automated inspection tool for commercial aircraft, says chief executive Yoge Patel.

“There are other airlines,” Patel said in an interview on the sidelines of the Remotely Piloted Aircraft Summit on 23 March at the International Civil Aviation Organisation (ICAO) in Montreal. Patel declined to elaborate on the airlines involved in the discussions.

For more than a year, Blue Bear has been working with Easyjet to demonstrate that an unmanned quadcopter called the Riser can replace aircraft inspection engineers. If there is any possibility that a commercial aircraft could have been damaged by lightning strike or hail, it must be inspected

“You allow the vehicle to fly around a commercial vehicle and it just does the inspection”

YOGE PATEL

Chief executive, Blue Bear Systems

before it can be returned to service. Carrying out these inspections using an automated UAS could reduce aircraft downtime and perhaps even the number of required spare aircraft, Patel says.

So far, Blue Bear has performed a demonstration using an aircraft cabin mock-up. The next step is to perform a follow-on demonstration inside an aircraft hangar with a representative aircraft, Patel says. However, she declined to give a timeline for the next series of indoor hangar tests.

Ultimately, Blue Bear and Easyjet want to show that the Riser can perform inspections on an aircraft inside a hangar or out-

side on an apron amidst an active airport operation.

A navigation technique called geofencing should confine the UAV to flying in a predetermined space around the aircraft, Patel says. Additional sensors, such as LIDAR, could be used for collision avoidance, she adds.

The objective is make the UAV inspection process fully automated, so the operator has no role other than to switch the system on or off.

“We don’t want a huge training burden. You allow the vehicle to fly around a commercial vehicle and it just does the inspection,” she says. ■



Airframe checks are required after lightning or hail strikes

AIRPORTS OLIVER CLARK LONDON

Heathrow plans £10m for domestic routes if third runway gains approval

London Heathrow intends to establish a new £10 million (\$15 million) fund to promote domestic routes if it gets approval to build a third runway.

The airport says the money would be provided to fund five new routes over three years and for increased frequencies on seven existing routes.

But it adds that the funding will only be made available if the

UK Airports Commission recommends Heathrow rather than Gatwick for a new runway in its final report, due to be published later this year.

Heathrow also intends to review its airport charges regime with a view to potentially introducing lower fees for domestic services.

The measures have been put together in response to the rec-

ommendation in both the House of Commons Select Committee's recent small airports report and from the National Connectivity Task Force that capacity needs to be ring-fenced at Heathrow for domestic services.

The airport currently has seven domestic routes: to Aberdeen, Belfast City, Edinburgh, Glasgow, Leeds Bradford, Manchester and Newcastle. ■



Europe stepping
closer to single sky
AIR TRANSPORT P13



The carrier's manuals do not specify if flightcrews are permitted to override an automated landing

INVESTIGATION MAVIS TOH SINGAPORE

China Airlines poor landing prompts training advisory

Taiwan's ASC makes recommendations after 747-400 veers off runway at Taoyuan airport

Taiwan's Aviation Safety Council (ASC) has recommended that China Airlines improve its training for autopilot landings, and for the country's airlines to enhance training and alertness in response to anomalies.

The move follows an investigation into an incident where a China Airlines Boeing 747-400 freighter veered off the runway during its landing roll at Taoyuan International airport. The aircraft was on the Abu Dhabi-Taipei Taoyuan route when the incident happened on 31 March 2014.

ASC says the crew of China Airlines flight 6416 had selected an autopilot landing under good weather conditions. There was,

however, another aircraft taking off and passing over the "instrument landing system [ILS] sensitive area" while the freighter was in the final landing phase on the same runway, resulting in ILS signal interference.

The compromised ILS signals affected the aircraft's autopilot, and it deviated from the runway centreline on landing. "[The] flight crew did not maintain situational awareness and manually control the aircraft by disengaging the autopilot when it behaved unexpectedly. As a result, the aircraft veered off the runway," says the ASC.

The flight crew also failed to notify air traffic control to check

if the ILS sensitive area was protected when they first selected an autopilot landing.

Investigations found that China Airlines' training did not develop specific scenarios that reflect actual line operation risks. The airline's manuals also did not specify if the crew is allowed to manually override an autopilot landing, nor have a standard regarding deviation from the runway's centerline.

However, China Airlines has since addressed the deficiencies identified, says the ASC.

The ASC has also called on Taoyuan airport to enhance runway foreign object detection and prevention mechanisms. ■

ACQUISITION
DAVID KAMINSKI-MORROW
LONDON

RwandAir opts for the long haul with two A330s

African carrier RwandAir has opted to acquire a pair of Airbus A330s to branch into long-haul operations next year.

It says it has reached a preliminary agreement to take a new A330-300 and -200.

RwandAir has selected Rolls-Royce Trent 700 engines for the jets. The aircraft will be delivered in the second half of 2016.

The carrier says it will configure one of the A330s with 300 seats and the other with 261, with both aircraft having three-class layouts.

"With its proven economics, reliability and passenger comfort, we have found the A330 to perfectly support our plans to expand into Europe and Asia," says RwandAir chief John Mirenge.

The carrier had previously indicated, about five years ago, that it was intending to enter the long-haul market using Boeing 767s. This came as the airline was also renewing its fleet with 737-800s.

However, it then looked at taking the 787 as a possibility for 2016 services to European and Asian destinations. Boeing does not list RwandAir as a customer for the 787. RwandAir's jet fleet includes 737s and Bombardier CRJ900s. It also operates a small number of Bombardier turboprops. ■

OPERATIONS

First Air looks to Q400s, ATR 42s to simplify fleet

Canadian carrier First Air is considering introducing Bombardier Q400s or ATR 42s as part of a strategy to modernise and rationalise its fleet.

Up to 10 aircraft will be ordered to replace and expand its turbo-prop operation. The first aircraft could be introduced by the end of the year.

The airline is aiming to simplify its fleet to just two types. It has been operating a diverse range of aircraft including the Boeing 767,

737-400 and 737-200, ATRs, and Lockheed L-100 freighters.

But chief executive Brock Friesen says that keeping spares and maintaining training for half a dozen types in a fleet of just 20 has "impaired" the carrier. First Air will "concentrate" on two types, he says. It is looking at the possible acquisition of additional 737-400s.

The airline's commercial vice-president, Bert van der Stege, says the carrier is "very good" at operating ATRs and 737s. ■



More 737-400s may be added



ENVIRONMENT

Hainan flies in local biofuel first

Hainan Airlines has become the first Chinese carrier to trial locally sourced biofuel on a passenger flight.

The flight took place on 21 March from Shanghai to Beijing, and involved a Boeing 737-800 powered by a 50:50 mix of conventional fuel and cooking oil-based biofuel. The trial was supported by Boeing, and the biofuel was supplied by Sinopec.

In 2011, Boeing and Air China teamed up for China's first biofuel flight, using a 747-400 powered by jatropa-based biofuel.

PROGRAMME FIRDAUS HASHIM SINGAPORE

Multiple missions for IAe turboprop

Indonesian manufacturer says N219 will be comfortable in roles from commuter transport to maritime surveillance

Indonesian Aerospace (IAe) has laid out the specifications of its proposed N219 commuter aircraft.

In a product brochure, the state-owned manufacturer says the N219 will be capable of operating in a number of commercial, military and parapublic roles. Missions include scheduled and chartered airline operations, troop transport, search and rescue, cargo, and maritime surveillance.

Using two Pratt & Whitney Canada PT6A-42 engines, it can operate up to 480nm (889km) with 19 passengers, while its maximum ferry range is 840nm. At its maximum take-off weight, it can take off from a runway with a minimum of 393m (1,290ft), and land with a minimum of 197m. It can reach speeds of 210kt (389km/h).



N219: prototypes due soon

The flightdeck will be a digital-based, glass cockpit. An autopilot will be an option.

IAe says the N219 has certain advantages over its competitors. These include a low direct operating cost, a quick change configuration, wide cargo doors, and the ability to operate at high speeds.

In an interview with Flightglobal in February 2014, vice-president for marketing and integrated aircraft solutions, Arie Wibowo, said IAe intends to roll out the first of four N219 prototypes in 2016. Two will be used for static and structural tests, and the other two for flight testing.

IAe has a target of selling 200 N219s over five to 10 years, adds Wibowo.

To date, only Indonesian regional operator Nusantara Buana Air has signed a deal to buy up to 20 N219s, valued at €120 million (\$131 million). The parent company of Lion Air, Lion Group, has also expressed interest in acquiring at least 50 N219s, although it has not placed any formal orders. ■

DISPUTE ELLIS TAYLOR SINGAPORE

Airbus sues Skymark over cancelled A380s

Airbus has filed a new claim against bankrupt Japanese carrier Skymark Airlines for penalties related to the termination of its A380 order last year.

Airbus says it submitted its claim to the Tokyo District Court on 18 March, adding: "We cannot comment further, as this is now a matter for the courts."

Skymark has previously indicated that it could be liable for claims of up to \$700 million over the cancellation of its order for six A380s.

The embattled carrier entered creditor protection in January

following heavy losses over the past financial year, under a debt burden of some ¥71 billion (\$588 million).

It will have to present a rehabilitation plan to the Tokyo District Court in late May, and has attracted expressions of interest from a number of parties, including All Nippon Airways and AirAsia, as potential sponsors.

Flightglobal's Ascend Fleets database shows that Skymark has 27 Boeing 737-800s in service, while its five A330-300s are in storage at Tokyo Haneda International airport. ■



A Skymark-bound A380 gets off the ground, but the order stalled

FLEETS TOM ZAITSEV MOSCOW

Superjets could go to Crimea

Russia's United Aircraft (UAC) has outlined a project to set up a Crimea-based airline using Sukhoi Superjet 100s.

The manufacturing group envisions supplying six Superjets to the proposed new operator, to be registered in the regional capital Simferopol.

Flightglobal understands that UAC is alluding to a batch of six long-range variants originally ordered by UTair.

Several of these aircraft have already been ferried to that carrier's technical base at the Zhukovsky airfield, which is outside Moscow.

The draft plan, submitted by UAC to the Crimean government for evaluation, envisages initial investment of around Rb1.5 billion (\$26 million) during the first three months.

UAC indicates that the carrier's network could comprise air links to some 14 domestic cities, with the potential for increasing the number of destinations to 36.

"Tentatively, it would be able to transport half a million passengers over the next year and reach profitability within three years," says deputy director of civil programmes Sergei Turik. ■



Sweden receives
its last Gripen C/D
DEFENCE P14

TRAFFIC DAVID LEARMOUNT LONDON

Europe stepping closer to single sky

The latest development in the SESAR concept is a four-year programme aimed at improving the efficiency of the service

Eurocontrol has launched the latest phase of the Single European Sky Air Traffic Management Research (SESAR) operational concept. It intends, by 2019, to deliver an intelligent, networked system capable of optimising individual flight efficiency while maximising traffic flow through finite airspace and airports.

Known as Reference Period 2 (RP2) of the Network Strategy Plan (NSP), the four-year programme is intended also to reduce the overall cost – and therefore the user charges – of the network.

The main components of RP2 include: enabling European ATM to act progressively more like a single networked system rather than a series of linked units; integrating the management of flights through en route, terminal airspace and airport operations so they work seamlessly together; and ensuring the



Blue sky thinking: the programme aims to bring huge cost savings

readiness of the advanced information management systems and communications, navigation and surveillance equipment that will enable the network to deliver a seamless, safer, cheaper and more efficient service.

By the end of the period, all departures and arrivals will be

(respectively) continuous climb and continuous descent, all trajectories will be the most efficient the airspace available permits, with free routing above 31,000ft, and there will be no holding or extended approaches on arrival.

In parallel with the execution of the NSP, the processes of Europe's

ATM system are gradually being prepared for radical change.

Rather than having the existing national air navigation service providers (ANSPs) continue to supply all the traditional air traffic control functions and infrastructure within a geographic region, Eurocontrol is moving to a concept of contracting out "centralised services". These are functions or tasks that, today, all ANSPs share, but if centralised with a single manager or provider, they could be made far more efficient.

In the second quarter of 2014, Eurocontrol invited "expressions of interest" in providing any of 18 different centralised services and received more than 400 proposals.

If management of all these functions were to be centralised, Eurocontrol estimates that €1.6 billion (\$1.7 billion) could be saved. ■

CABINS MAVIS TOH SINGAPORE

Cathay confirms A350-900 seat configurations

Cathay Pacific Airways has confirmed the configuration of its Airbus A350-900s on order.

The aircraft will have 280 seats, comprising 38 in business class, 28 in premium economy and 214 in economy.

Cathay is due to take delivery of the first of 48 A350s in February 2016.

The Hong Kong-based carrier is working with Porsche Design Group on the design of its new A350 cabins.

Flightglobal's Ascend Fleets database shows that Cathay has 22 A350-900s and 26 A350-1000s on order, as well as orders for 21 Boeing 777-9Xs.

Its widebody fleet is made up of A330s, A340s, 747s and 777s. ■



Cathay has 48 A350s on order

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FLEET CRAIG HOYLE LONDON

Sweden receives its last Gripen C/D

Final delivery of current fighter gives air force 98-strong fleet, with next delivery to be an E-model example during 2019

Saab has delivered its final Gripen C/D ordered for the Swedish air force, with single-seat fighter 39294 having been flown from its Linköping final assembly site to the F 17 wing at Kallinge air base near Ronneby on 19 March.

The service's total fleet of the type stands at 74 Gripen Cs and 24 D-model trainers, and its next example to be delivered will be the first of at least 60 manufactured in the advanced E configuration. Saab is under contract to hand over its first example of the

larger and more powerful model during 2019, with Brazil also having ordered 36 of the new-generation type.

Meanwhile, Sweden's Defence Materiel Administration says testing is ongoing in Linköping prior to the release of the Gripen's MS20 operating software standard. This will enable the Gripen C/D to deploy new weapons, including MBDA's Meteor beyond-visual-range air-to-air missile and Boeing's Small Diameter Bomb, and also provides radar system enhancements. ■



Aircraft 39294 arrived at Kallinge air base on 19 March

INCIDENT CRAIG HOYLE LONDON

Voyager report gives snapshot of RAF 'near-miss'

An in-flight mishap involving a Royal Air Force Airbus A330 Voyager en route to Afghanistan last year has been categorised as "an extremely serious near-miss", following the completion of a service inquiry.

Fresh details of the 9 February 2014 event involving aircraft ZZ333 were disclosed in a report published on 19 March, one year after interim findings showed that it entered a steep dive from a cruise altitude of 33,000ft after its captain accidentally jammed a camera into his sidestick control as he moved his seat forwards.

According to the new report, the widebody was out of its pilots' control for 33s over the Black Sea north of the Turkish coast, during which time it lost 4,400ft.

Within 10s of the forward stick input, the A330 had reached a 17° nose-down attitude. Its automatic high-speed protection system was triggered 3s later, with a maximum indicated air speed of 358kt (662km/h) recorded.

As the aircraft pitched down, the aircraft's captain – who was alone in the cockpit – attempted to disengage the autopilot and pull back on his sidestick. The co-pilot, who had been in the forward gallery area for around

15min, attempted to return to his seat, although he was weightless under a maximum of -0.56g. "With his feet on the flight deck roof, the co-pilot reached down and attempted to disengage the autopilot by pulling back on his sidestick," the report says.

With dual inputs being delivered, the A330's flight protection system was automatically engaged. Around this time, the captain's camera – which investigators found had last been used 3min 20s before the loss of control – was removed "by means of a physical manipulation".

"From the onset of the pitch-down until the removal of the camera 33s later neither pilot had control of the aircraft," the report

states. "The initial recovery from the dive was the result of the aircraft's own protection measures, and not the product of pilot inputs." They then set the thrust levers to idle and raised the aircraft's nose, before selecting take-off and go-around power and regaining straight and level flight at 31,000ft, before diverting to Incirlik air base, 340nm (630km) away.

The report says the captain – who initially suspected an autopilot failure – considered switching off the A330's air data and inertial reference units, in order to bring it under "direct law" control. Had he done so, "the aircraft's self-protection measures for overspeed and pitch would have been disabled [and] the cer-

tified limit of 365KIAS would have been exceeded by a significant margin, potentially leading to significant damage to the aircraft", the report says.

The mishap – which subjected the airframe to a maximum 2.06g during the recovery – resulted in seven dented ceiling panels and other minor damage, including to 50 in-flight entertainment sockets. Seven crew members and 25 passengers were also "rendered temporarily unfit for duties following the incident".

According to the report, "this was the first flight control/object/armrest interaction of this nature to be reported" to Airbus from over 190 million flight hours with the A330 family of aircraft. However, investigators found 26 unreported instances where the autopilot had been inadvertently disconnected during a Voyager flight between April 2012 and March 2014.

"Without the excellent technology of the Airbus A330 flight control laws, the outcome could have been very different, with the realistic potential for the loss of the aircraft and 198 of our people," Military Aviation Authority director general Air Marshal Richard Garwood says in his summary of the incident. ■



The A330 was out of its pilots' control for 33s over the Black Sea



Integration challenge delays KC-46A
DEFENCE P17

POWERPLANTS DAN PARSONS WASHINGTON DC

US Army engine contest spools on to next phase

Competition for the US Army's improved turbine engine programme (ITEP) is shaping up to be a head-to-head battle between single- and double-spool turboshaft designs.

The army is set to award preliminary design review contracts to two companies in May – almost certainly one each to General Electric Aviation, which builds the 2,000shp T700 that ITEP will replace in Boeing AH-64 Apache and Sikorsky UH-60 Black Hawk helicopters, and the Pratt & Whitney/Honeywell Advanced Turbine Engine Company (ATEC).

“The single-spool is a simpler, lighter-weight configuration. Dual-spool adds lots of complexity”

MIKE SOUSA

Advanced turboshaft programme manager, GE

The programme goal is to deliver a “drop-fit” replacement for the single-spool T700 with a 3,000shp output and 25% improvement in fuel efficiency.

“We think single-spool is the best way to go forward,” says Mike Sousa, advanced turboshaft programme manager at GE. “Our argument is the single-spool is a simpler, lighter-weight

configuration. Dual-spool adds lots of complexity.”

In a single-spool engine, all the rotating components are on one shaft and must spin at the same speed, while in a double-spool design, certain rotors in the compression section are allowed to spin faster or slower than others in order to achieve optimum performance efficiency.

Sousa notes that while the latter configuration allows the engine to have a higher pressure-to-power ratio, GE sees this as not applicable for ITEP, “because the turbomachinery is too small”.

The P&W/Honeywell team chose to pursue a double-spool architecture because it “could not tolerate” sacrificing the amount of speed necessary to achieve the army's desired performance and fuel efficiency goals with a single-spool design, says ATEC vice-president of programmes Jerry Wheeler. “For this application and these performance characteristics we needed to develop it with a two-spool gas generator approach,” he adds.

The ITEP activity received \$51 million in the Obama administration's budget request for fiscal year 2016, with total development costs expected to reach \$720 million. A contractor selection is anticipated in time to commence an engineering and manufacturing development phase in the middle of FY2018. ■



The JPO has forecast total operating and support costs at \$859bn

ASSESSMENT DAN PARSONS WASHINGTON DC

F-35 review backs assault on price

Selected acquisition report adjusts forecast as reduction in labour expenditure drives \$7.5bn of additional savings

The overall cost of the Lockheed Martin F-35 Lightning II programme should come in at about \$7.5 billion less than previously forecast, according to a selected acquisition report (SAR) released on 18 March.

Research, development, test and evaluation costs are unchanged at \$54.9 billion, but the report says procurement costs declined by \$7.7 billion, to \$331 billion. This reduction is primarily due to decreased labour costs, the F-35 Joint Program Office (JPO) says.

The SAR says that the operating and support costs of the F-35 over its service life remain nearly \$1 trillion, but the cost assessment programme evaluation used to author the report does not adjust figures until a major milestone is reached. The JPO claims its latest estimate shows a \$57.8 billion reduction from 2014, bringing the overall figure down to \$859 billion.

Lockheed's F-35 programme general manager, Lorraine Martin, says the company has re-

duced operating and support costs for the F-35 by \$60 billion in the past year alone, due to “a laser focus by the entire government and contractor team on reducing costs across the board”.

“We have numerous initiatives in place, including the Blueprint for Affordability, that will drive programme costs even lower.”

Lockheed is aiming for a price tag of around \$80 million per F-35A, including its Pratt & Whitney F135 engine by the time it enters full-rate production by 2019.

The SAR puts the unit recurring flyaway (URF) cost of an air force F-35A at \$108 million in the eighth lot of low-rate initial production, which was signed in late 2014. This was \$4 million less per aircraft than for the previous batch.

“The actual contract negotiated cost of aircraft and engine with fee continues to come down, and remains well below the SAR lot yearly URF estimates,” the JPO says. ■



Increased power and better fuel efficiency is needed for the AH-64

ROTORCRAFT

Caïman set for anti-submarine role

France's navy has declared initial operating capability for its NH Industries NH90 Caïman helicopters operating in the anti-submarine warfare role.

Deliveries of NFH-variant rotorcraft began for the service in 2010, and Flightglobal's Ascend Fleets database says it now has 13

of an eventual 27 examples.

The latest milestone follows the successful integration of the Eurotorp MU90 torpedo with the platform. One Caïman is currently embarked with the air defence frigate *Chevalier Paul* on the Arromanches mission in the Persian gulf, the navy says. ■



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Malaysian link pays off as operators swoop for EV-55s
BUSINESS AVIATION P18

DEVELOPMENT DAN PARSONS WASHINGTON DC

Integration challenge delays KC-46A

Fully-outfitted tanker likely to miss first flight target by two months, but Boeing insists programme still on track for USAF

The first Boeing KC-46A configured as an aerial refuelling tanker will miss its planned April flight debut because of issues with the integration of military-specific components and systems, a senior US Air Force official says.

Engineering and manufacturing development aircraft one (EMD-1) was flown for the first time on 28 December 2014, but the 767-2C is not equipped with systems required to test the aircraft's refuelling capability. The first fully-outfitted KC-46A, EMD-2, had been scheduled to fly in April, but air force secretary Deborah Lee James told a US Senate panel on 18 March that it will miss that date, because internal Boeing production targets have not been met.

"We had a successful first flight of the 'green' aircraft," James says. "However, there have been testing and integration challenges" with the first example configured as a tanker, and while Boeing generally continues to meet contractual obligations, internal production and developmental targets have slipped.

"The [first flight] timeframe



A 'green' 767-2C made a December debut, but is not equipped with in-flight refuelling systems

we're looking at is more likely later on in the summer," she says. Brig Gen Duke Richardson, the USAF's programme executive officer for tankers, had indicated that the service is planning for the aircraft to get airborne before the end of June.

Boeing notes that it has no contractual deadline for making the first flight of a KC-46A, but must deliver 18 operational examples by August 2017 in order to achieve a so-called required assets available milestone.

"We are comfortable that we

will make that," the company says. "Our team is working really hard to get the plane ready to fly and get it into flight test."

It is "very common to experience challenges during the early development phases" of such a large programme, it adds, and fixes identified with tanker-configured EMD-2 will be applied to future airframes.

The KC-46A programme is being conducted under a \$4.4 billion fixed-price incentive development contract, which limits the

US government's liability for costs over \$4.9 billion. The tanker's estimated total development price is currently around \$900 million above the February 2011 award value, and Boeing has already announced a \$270 million forward loss related to resolving wiring issues discovered last year.

Once it flies, EMD-2 will be outfitted with internal fuel tanks and a refuelling boom, to allow for almost immediate engagement in aerial refuelling test flights over Puget Sound, says Boeing. ■

PROCUREMENT BETH STEVENSON LONDON

Global trade in UAVs on the rise, says SIPRI study

An arms transfer study from the Stockholm International Peace Research Institute (SIPRI) reports that only Nigeria and the UK have been the recipients of armed unmanned air vehicles, despite "widespread interest" in their acquisition.

The numbers of importers and exporters of both armed and

unarmed UAVs has "grown significantly" over the past 15 years, SIPRI says. Between 2010 to 2014, 35 countries and the UN acquired a combined 429 UAVs in weight categories above 25kg (55lb).

In its Trends in International Arms Transfers, 2014 paper, SIPRI identifies the USA and Israel as

having been the main suppliers of UAVs, and lists Austria, France, Germany, Iran, Italy, South Africa and Sweden as also having exported systems.

Nigeria's armed UAVs are believed to be the Chinese-developed CH-3s that it has used during the fight against

Boko Haram militants.

The UK has acquired a total of 11 General Atomics Aeronautical Systems MQ-9 Reapers, including one damaged during operations in Afghanistan. The type is currently being used in the coalition campaign against Islamic State insurgents in Iraq and Syria. ■

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ENGINES

GE Honda wins FAA approval for HF120 factory

GE Honda Aero Engines has cleared a key milestone for its HF120 turbofan, which powers the HondaJet light twin-engined business jet, with the US Federal Aviation Administration granting production approval for its new manufacturing plant in Burlington, Massachusetts.

This validation comes more than two years after the 2,095lb (9.32kN)-thrust engine, developed by GE Aviation and HondaJet, secured US approval.

The new clearance allows the company to build the powerplant to type-design specifications without FAA oversight.

The \$4.5 million HondaJet is the first platform for the HF120, although it has also been selected by US engineering company Sapphire for its Cessna CitationJet upgrade programme.

The 186m² (2,000ft²) plant has capacity to build up to 500 engines a year. It will also carry out engine maintenance, repair and overhaul work.

The six-seat HondaJet is scheduled for certification and service entry in the coming weeks. ■

SALES KATE SARSFIELD LONDON

Malaysian link pays off as operators swoop for EV-55s

Newly-acquired Evektor seals commitments for four of its Czech-built utility twin turboprops

Czech aircraft manufacturer Evektor has secured memoranda of understanding from two Malaysian companies for the purchase of four EV-55 Outbacks.

Deliveries of the twin-engined turboprops are scheduled to start in 2017 to Senai Airport Terminal Services and APFT Services. Senai will use two of the high-wing, all-metal types for air taxi

operations, connecting various Malaysian islands.

APFT's EV-55 duo will also be used for commercial operations.

Evektor was acquired last year by Malaysian company Aspirasi Pertiwi, throwing a much-needed lifeline to the EV-55 programme, which was launched in 2005. A funding shortfall slowed its development significantly, but As-

pirasi has committed significant investment to bring the 800nm (1,480km)-range aircraft to market and establish a sales and service network to support the fleet.

The airframer says it recently submitted its application to EASA and is working towards CS-23 certification of the nine- to 14-seat utility aircraft.

The first EV-55 prototype (MSN001) made its maiden sortie in 2011 and has logged over 220h to date. A production-conforming aircraft is being assembled and is due to join the flight test programme in the third quarter.

Powered by a pair of Pratt & Whitney Canada PT6A-21 engines, the EV-55 is Evektor's first foray into the business and utility aircraft market. The manufacturer says its objective is to replace the huge fleets of "obsolete" six- to nine-seat piston twins – including Cessna 402/404s – and be a "successful competitor" to single-engined rivals such as the Cessna Caravan and Pilatus PC-12NG. ■



Aspirasi's takeover last year gave a boost to the EV-55 programme

VIP CHARTER KATE SARSFIELD LONDON

Royal Jet plots FBO expansion

VIP charter operator Royal Jet is planning to add a third fixed-base operation to its portfolio this year and is also eyeing three other possible destinations, which currently have little or no aircraft and passenger handling provision.

The Abu Dhabi-headquartered operator established its first FBO outside its home base last year, at-Seychelles International airport, in partnership with the country's flag carrier Air Seychelles. The carrier is 40% owned by Abu Dhabi's national airline, Etihad Airways.

"We are now fully up and running," says Royal Jet chief executive Patrick Gordon.

He says the company's strategy is to establish an FBO presence at

destinations popular with its growing customer base, but where there is little or no handling service available. He will not be drawn on which destinations it is evaluating, however, but has ruled out Europe, saying this market is already very competitive and crowded.

"The new FBOs will be in one of the [105-plus] countries that we currently fly to," Gordon says.

Royal Jet made 2,600 flights in 2014 – around 200 more than the previous year – and demand for its 11-strong VIP fleet continues to grow. The company is the largest operator of Boeing Business Jets in the world, with six of the VIP airliners in service. Two more BBJs are set for delivery to an unnamed completion centre this year. ■

RELOCATION KATE SARSFIELD LONDON

TBM popularity prompts move to bigger US base

Daher has relocated the North American headquarters for its TBM aircraft business to a much larger facility nearby. The move is in response to the burgeoning demand for the new TBM 900 within its largest market and increased demand for after-sales support from existing operators of the single-engined turboprop series.

The new base in Pompano Beach, Florida boasts 3,000m² (32,000ft²) of hangarage, compared with less than 1,000m² at its former home in Fort Lauderdale. "We will be able to handle eight TBMs at a time now and improve our maintenance offering to in-

clude avionics upgrades and full aircraft overhaul," says Daher.

"Pompano Beach also has longer runways, which will cater for the customers who also own a big jet besides their TBM," it adds.

Over 75% of Daher's 700-plus global TBM fleet is based in the USA and Canada, it says. US customers accounted for nearly 80% of last year's 51-shipment tally and hold the vast majority of orders for the \$3.7 million TBM 900.

"The new facility will allow Daher to leverage the company's brand and resources as it meets the evolving demands of a growing customer base," says Daher. ■



We're listening
FEATURE P20

LIBERALISATION ELLIS TAYLOR LANGKAWI

Clouds clearing for Asia's open skies

Carriers embrace move towards regional freedoms, but experts warn European-style single aviation market is still far off

Hopes are high that the Association of Southeast Asian Nations (ASEAN) will be able to take further steps towards establishing a single aviation market over the next few years, with the progress of the ASEAN open skies initiative having been the subject of a panel discussion at an aviation summit held in conjunction with the Langkawi International Maritime and Aerospace exhibition in Malaysia.

Professor Alan Tan of the National University of Singapore explained that under the current framework, carriers will from 1 January 2016 be granted unlimited third- and fourth-freedom rights between ASEAN capital cities, with the exception of Manila in the Philippines. Thereafter, rights will be opened to secondary cities. Laos and Indonesia, which are currently holding out, are expected to fall in line.

Wolfgang Sander-Fischer, air transport expert for the ASEAN Air Transport Integration Project, describes the situation as "half-open skies", which will not deliver the benefits of a fully open market, such as in the EU. Nevertheless, he applauds it as a good starting point that could lead to further developments.

"Achieving the first step of open skies is a wonderful thing – but it is only the first step."

RIGHTS

Tan made a strong call for full "seventh-freedom" rights to be part of later agreements. Such rights will allow carriers to establish bases outside of their home nation without requiring a 51% local ownership.

"That currently is not on the table and I would like to see it on the table after 2015 – maybe in part II, if you like," he says.

AirAsia chief executive Aireen Omar says that in such a scenario, the budget carrier could restructure its joint ventures across the region, with each being able to play to its "comparative advantage".



AirAsia's chief executive believes it will build traffic volume, despite increase in low-cost rivalry

But Malaysia Airlines' vice-president of long-term planning and network Liew Chee Khuan was less enthusiastic about future steps, noting: "How open is open enough? If most of the population base is within the capital cities then you have achieved a specific part of the objectives."

Tan, however, warns that the ASEAN group needs to stick together on the liberalisation agenda, or the region will "lose the game to external parties". He points to the ASEAN-China bilateral agreement as a case in point. That framework allows Chinese carriers unlimited capacity between all cities in China and Southeast Asia, potentially opening up more markets for them, than for the airlines based within ASEAN states.

Looking further ahead, most panel members called for a greater harmonisation of rules and regulations to truly allow a single market to develop.

"Many more measures will have to be taken to safeguard a high level of safety, high level of security, environmental protection, competition rules, consumer protection etc," says Sander-Fischer. "Only once that is all in place can we call this a single aviation market."

Omar agrees, pointing out that measures such as the mutual recognition of engineering licences will allow carriers to better allocate labour where it is needed, rather than getting caught in licensing issues across different countries. She also calls for a harmonisation in air traffic management and airways charges for carriers to operate more efficiently, allowing them to then grow connectivity within the region.

HUBS

Most panellists agreed that, within the current framework, carriers that already have a strong hub operation – and the airports that support them – will benefit most from the moves towards a single market.

"The winners will ultimately be the carriers in the centre of the traffic flow, not at the end point. China is an end point, India is an end point from an ASEAN perspective," says Liew. "Those airports in the centre that command the crossroads of trade and travel, the airline that serves that is going to win."

Tan says the regions' major hubs – Singapore Changi, Bangkok Suvarnabhumi and Kuala Lumpur International – will be the biggest beneficiaries. Should Indonesia

properly address the infrastructure constraints at Jakarta's Soekarno-Hatta International airport, it will also stand to gain a large amount of traffic. "Remember they have half the ASEAN population, so they could give the others a run for their money," he notes.

To a large extent, Tan says, this would rely on Garuda Indonesia and Lion Air "stepping up their game" to offer more connectivity throughout Southeast Asia.

Sander-Fischer says that secondary airports with international status will also win once secondary routes are liberalised. "The losers on the airport side are those that can't grow; where there is no secondary airport that can't be built easily."

Omar notes that liberalisation is expected to spur a wave of new carriers – especially in the low-cost space, but that AirAsia will not be threatened as long as it is "able to build the traffic volume".

In closing, industry stalwart Professor Rigas Doganis summed up the situation succinctly: "We're not going to have open skies – we're going to have cloudy skies, but the clouds are slowly clearing." ■



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WE'RE LISTENING

EASA has finally answered the call to ease the sector's regulatory burden with its GA roadmap – but a big effort is needed to get more people flying

KATE SARSFIELD LONDON
DAVID LEARMOUNT COLOGNE

Things are looking up for Europe's embattled general aviation community. The years of impassioned lobbying aimed at raising the profile of this huge sector and easing the regulatory burden on the operators of its 40,000+ aircraft fleet are finally paying off.

Late last year, EASA answered the calls with the publication of a GA roadmap in which it sets out plans to simplify and moderate the rules for light aircraft through a performance-based regulation (PBR) approach.

Patrick Ky, the agency's director and a long-time GA proponent, admits that in the early days of EASA, this sector was saddled with a "light" version of commercial aviation rules, which he believes are totally inappropriate and need to be completely redrafted, especially at the relatively low-tech leisure and private pilot licence (PPL) training end of the spectrum.

Under Ky's stewardship, the agency is looking to simplify a number of key areas, including pilot training, maintenance, aircraft and systems certification and oversight.

PRIORITY

"GA is a high priority for EASA, which recognises that existing regulations may not necessarily be proportional to the risk exposure of GA," says Trevor Woods, EASA's standardisation director. "This roadmap will change the way we work with the industry. We are listening to you."

Woods' declaration is welcomed by the GA community, but for many, EASA's blueprint does not go far enough. It will do little, they argue, to revitalise an industry that is still reeling from more than six years of economic austerity.

"The roadmap is largely limited to leisure flying and initially to aircraft under 2,000kg [4,400lb]. In order to revive the struggling GA industry, it needs to apply the same principles across the light aircraft sector," says Martin Robinson, senior vice-president of the Eu-

ropean arm of the International Council of Aircraft Owner and Pilot Associations.

IAOPA represents the interests of more than 23,000 members in dealings with regulatory bodies including the European Commission, EASA and Eurocontrol.

"This industry won't fully recover until flight activity grows throughout the sector," adds Robinson, who is also chief executive of AOPA UK.

A great deal of work still needs to be done at grassroots level, he argues, to bolster the GA community. "There simply aren't enough people flying and the knock-on effect of this inactivity is reverberating across the industry from aircraft manufacturers and flight training schools to flying clubs and aerodromes," he says.

LICENCES

He cites the rapid decline in the numbers of private pilot's licences issued in the UK – one of Europe's largest GA markets, with a fleet of over 8,000 aircraft – to illustrate his point.

In 2005, the UK CAA issued about 3,500 PPLs, notes Robinson. "That number fell to



2,500 in 2014 and fewer than 40% of pilots are renewing their licences," he adds. These statistics are mirrored by a recent CAA study, which found that flying activity at flying schools and aerodromes across the UK has declined by around 40% since 2005.

The extent of the industry decline in the UK was put into sharp focus in a government-sponsored study, published on 28 March. It revealed that the economic value of GA to the UK economy has dropped by half to \$1 billion since 2005 because of the declining numbers of participants.

"GA activity has simply fallen off a cliff," says Stephen Slater, vice chairman of UK pressure group the General Aviation Awareness Council. "The impact of this decline has also been felt acutely by the country's aerodrome community," he adds.

The UK, perhaps more than any other country in Europe, has witnessed a systematic decline in its airport numbers in recent years. "It's hard to believe there was an impressive wartime legacy of over 680 airfields," Slater adds.

SITES

Over the three decades the number of licensed landing sites has declined at an accelerated pace. "I've now been working on airfield planning issues for a little over three years. In that time, seven sites have ceased operating and a number of others are now under threat from housing developers and other planning issues such as wind farm development," he adds.

Pansanger aerodrome, for example, has been sold to developers who are planning to build 700+ houses on the site, which is 40km (25 miles) from London. "These aerodromes are situated in prime locations and the land can be sold for a high price," says Robinson.



Tax breaks could spur more training flights

GAAC regularly has to confront planning applications to place large wind turbines near aerodromes. "As all the primary wind farm sites have been used up, some developers are trying to site their [units] close to airfields, which can be very dangerous, given the downwind turbulence of some of these huge turbines," Slater says.

The precarious situation of the UK's aerodromes illustrates the seriousness of the situation for GA.

While EASA is tackling some of the pressures facing European GA, little is being done to encourage people to take up flying. "Without the pilots, you don't have an industry," says Robinson, "but the cost of continuing to fly or taking up flying has simply become too prohibitive for many."

The implementation of Part M maintenance regulations and the continuing airworthiness management organisation (CAMO) system have proved costly for many owners and training companies.

"The CAMO has not only driven up maintenance costs by 25% on average for traditional fixed-wing aircraft – more for rotary types – it has contributed to the decline in the number of hours flown because administration is soaking up so much of the available cash," says Robinson.

While EASA is now seeking to remove the requirement for a CAMO for aircraft weighing less than 2,000kg, as part of the roadmap, the rule will continue to apply to all aircraft above this weight and all commercial flight schools, regardless of the aircraft's weight.

"Remove the CAMO for all light aircraft and put the money back into flying," Robinson asserts. "Increased administration doesn't improve safety. A well-trained pilot improves safety," he says.

Affordability is a key ingredient to driving up pilot numbers and revitalising the fragile GA industry. "The passion for flying is still there," Robinson argues, but many prospective pilots are opting for kit planes, micro-lights and motorgliders, which are not subject to the same stringent regulations as their certificated counterparts and are far cheaper to purchase and operate.

"Traditional aircraft such as a Piper Arrow will cost around £180 [\$270] per hour to hire. Compare this to £120 for a micro-light and £70 for a self-launching motorglider and you can see why many traditional manufacturers and training schools are struggling," says Robinson.


INCENTIVES

He believes incentives such as tax breaks on fuel or flight training will also help drive down the cost of flying and stimulate business. "The UK government hails the success of the country's film industry, which, like the GA industry, was worth £1 billion to the economy last year. Unlike GA, however, this sector is offered tax breaks and incentives to help it grow. We are given no financial support at all," says Robinson.

Slater agrees: "What is keeping the fires burning across many parts of this industry is the dedication and passion of the people working in it," he says. ■

Developers have bought Pansanger aerodrome in order to build housing





A decade after its introduction in the USA, the LSA sector is benefiting from devolved regulation to make its mark in general aviation

SPORTING CHANCE

Legend Aircraft

DAVE GRAHAM DALLAS & DUBLIN

Sun-n-Fun in April 2015 will mark the 10th anniversary of the introduction of the light sport aircraft sector in the USA. Both Evektor and Flight Design obtained their S-LSA certificates on the opening day of that 2005 show. Conceived by the US Federal Aviation Administration as a way to bring ultralights under FAA influence and as a reaction to the hodgepodge of European ultralight regulations (where each country has its own standards), the then FAA administrator, Marion Blakey, expected 9,000 US-registered LSA by 2015.

LSA are simple single or two-seat aircraft, with a fixed-gear and piston engine, weighing no more than 600kg (1,320lb), or 650kg in the case of a seaplane or amphibian.

Instead of the regulator in the form of the FAA writing the standard that these aircraft are designed to, ASTM International acts in its place. The FAA and latterly EASA have

seats on these standards writing and updating committees. The authorities then specify which standards and revisions they have adopted. Using ASTM International for standard writing, updating and promulgation enables much quicker changes and modifications than EASA's and the FAA's internal mechanisms.

In the USA, under the FAA system, the same logic applies to manufacturers' quality systems and continued airworthiness programmes. Quality system requirements are specified by a separate ASTM International standard. Instead of having airworthiness directives issued by the FAA, each manufacturer is responsible for issuing service bulletins to owner/operators.

HONEST

Responsibility for conformance validation lies with the manufacturer. Random conformance audits by the FAA on manufacturers keep the system honest. In Europe, aircraft manufacturers still have to obtain a production organisa-

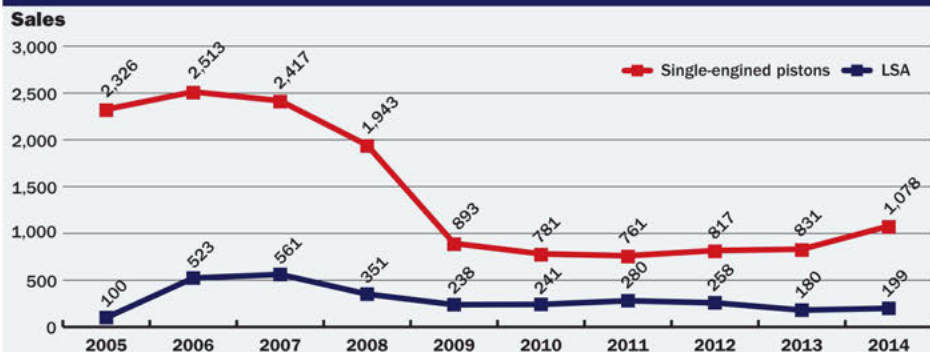
tion approval (POA) and design organisation approval (DOA) to obtain a restricted type certificate to fly LSA in European airspace.

The first 10 years have shown that LSA accident rates in the USA are a similar level to those in the general aviation fleet. In the early days, the biggest contributor to loss statistics were high-time pilots transitioning to LSA. Used to heavier iron, they did not appreciate the finesse required to pilot a lightly wing loaded aircraft with a relatively high power-to-weight ratio. When training accidents are reviewed, sport pilots learning on LSA have a statistically almost identical accident ratio to student pilots learning on Part 23 certified aircraft.

As a greater proportion of LSA are used for flight training, the better comparison is with equivalent two-seat certificated aircraft. One noticeable improvement is that fatalities from accidents are lower in LSA. Modern design, crashworthiness knowledge and better materials contribute to this.

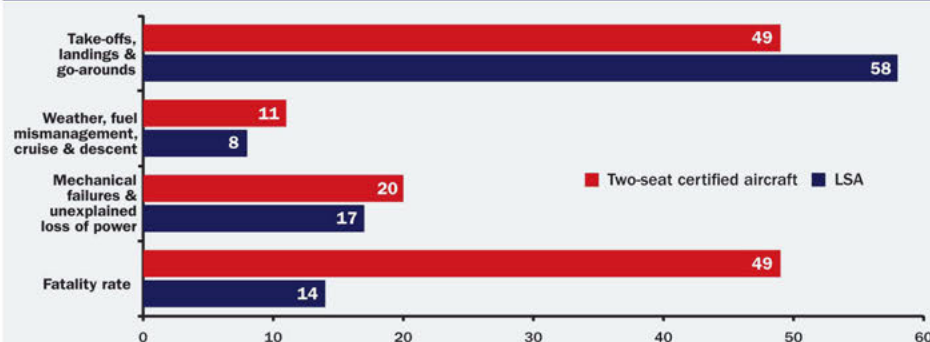
Cub types have accounted for one-third of all LSA sales for the past three years

SALES OF LSA AND TRADITIONAL PISTON SINGLES 2005-2014



SOURCE: GAMA and LAMA

LSA ACCIDENT RATE VS TWO-SEAT PART 23 AIRCRAFT (%)



SOURCE: AOPA Air Safety Foundation

“We are waiting for the day to come, where light sport aircraft standards will be unified around the world”

IVO BOSCAROL

Chief executive, Pipistrel

matters, models sold as LSA in one market may be sold as ultralight/microlight in another.

Considering that the biggest engine supplier, Rotax, delivers more than 2,500 912 series engines a year, the number is likely to be substantially higher. The numbers do not include experimental LSA (either factory- or amateur-built) and ultralights converted to LSA. How close US registrations are to Marion Blakey's 9,000 prediction is simply unknown. Worldwide the figures are even more opaque.

What can be said is that LSA represent a significant proportion of single-engine piston deliveries every year. Without accurate information from each market worldwide, the 20% number likely under-represents the scale and scope of LSA's success.

It is rare to see a LSA that has the minimum equipment. Buyers in this market expect the latest in glass-panel technologies, multiple redundancy and sophisticated autopilots. The average S-LSA sales price is \$178,000, despite a base price average closer to \$120,000.

Avionics manufacturers are responding. Dynon Avionics and Garmin are the two dominant suppliers. In 2011, Garmin hired a team solely responsible for light-sport and experimental aircraft. After matching Dynon's price point, it has continued to innovate. Garmin's G3X Touch system, introduced last year, provides an airliner level of cockpit. Last month, Garmin introduced flight envelope protection for Garmin autopilot-equipped aircraft.

POWER

Engine manufacturers are also investing in the light sport sector. Rotax's latest fuel-injected 912iS series engine consumes 20% less fuel at the same power output of its previous engine. Buyers are prepared to pay a premium to have this technology. Lycoming's O-233 and Continental's O-200D engines were also developed specifically for the light-sport market. Produced exclusively for the Cubcrafters Carbon Cub, ECI's 180hp (134kW) Titan engine has also had a great production run.

Seaplanes are hot property in the light-sport sector. Icon's A5 launch in July 2008 really opened up this market. Icon's approach is interesting. Instead of selling to an informed pilot market, it has targeted customers interested in water sports and adventure. Its aircraft is being offered as a “lifestyle enhancer”. Icon plans to offer pilot training as part of the sale of its aircraft. Deliveries are due to start in

Insurance companies have reported that average LSA losses are higher than in the general aviation fleet. Contributing to this are multiple factors: a lack of available spare structural parts close to market; a lack of personnel experienced with the newer aircraft and the fact that structural repairs must be documented and approved by the LSA manufacturer, rather than being signed off by the repairing organisation.

The first two are improving over time. The third is a major ethos change in the way aircraft are supported. Loss values will remain higher for LSA for this reason.

From a standing start in 2005, US S-LSA (factory-built LSA) registrations currently account for 20% of total single-engine piston deliveries worldwide, as reported by GAMA. Impressive as that number is, it only accounts for deliveries within the USA. Complicating

» the fourth quarter of 2015. With over 1,000 deposits, Icon's approach may just be what this market needs to expand dramatically. Cirrus is currently working with Icon to produce composite sub-assemblies for the Icon A5. Competing options include MVP Aero, Super Petrel from Brazil, Atol from Finland, Vickers Aircraft from New Zealand, and a much revamped offering from Searey.

"Modernised" Cubs are doing exceptionally well. Cub types have accounted for one-third of all LSA sales for the past three years. When all other tail dragger options are included, this rises to 45%. CubCrafters, based in Yakima, Washington state, is the leader of the pack, delivering a solid 50 aircraft per year over the past three years. Texas-based American Legend Aircraft delivered 20 aircraft last year. Typical Cub buyers own multiple aircraft. Very few end up in flight training.

JOY

Traditional GA manufacturers are staying away. Cessna, Piper and Cirrus entered and exited the light-sport market. Diamond is on record as saying that it will not produce a LSA. The typical buyer is more interested in the joy of flying, rather than productivity gain. LSA operating margins are not as high as general aviation manufacturers like. With over 100 aircraft options, it's also a lot more competitive.

Successful manufacturers are moving into traditional certificated aircraft markets. Flight Design's new C4 is expected to launch in 2016. Tecnam has certificated several aircraft including its P2006 Twin and P2010 four-place single. Evektor is working on a turbine multi-engine aircraft. Located in Europe, these companies have become adept at customising the same aircraft for several different certification regimes. It gives them an agility and customer proximity traditional manufacturers lack. Do not be surprised to see more successful LSA companies become fully Part 23 certificated manufacturers.

The FAA's Sport Pilot Rule introduced new categories of aircraft, pilots and maintenance personnel. The regulations lowered the cost



Italy's Tecnam designed the Astore LSA

of entry from around \$10,000 to \$5,000 for new pilots in the USA. Instead of being limited to older aircraft, those new pilots could purchase new aircraft for about half the cost of a new Cessna C172. New maintenance certifications encouraged maintenance professionals from other industries to get involved.

Initial design standards grew out of the joint aviation requirements – very light aircraft (JAR-VLA). There is constant debate on the weight limit being arbitrarily set at 600kg. Commentators complain that aircraft are too light and as a result, more difficult to fly. This is true, but the fault is not with the weight limit, but on the mandated 45kt (83km/h) maximum stall speed. Making this a minimum, rather than a maximum stall speed would have allowed for smaller wings, higher wing loadings, greater cross-wind capabilities and easier-to-fly aircraft. Limiting speed to 120kt was designed to discourage what happened to ultralights in Europe, where each new aircraft had to be faster and faster. A speed limit was sensible. More than 120kt is desirable.

In the USA, no medical is required to fly an LSA. This was a brave decision by the FAA. Ten years of accident results have shown that medical incapacitation runs at statistically similar levels for those operating with sport pilot privileges (without medicals) as those with medicals. Eliminating the medical requirement was sensible. This has led to pressure on the FAA to eliminate the medical requirement from private flying altogether.

Traditional aircraft certification requires the FAA to witness and audit each stage of the design verification. Under the LSA rule, the FAA passed complete responsibility for the validation of conformance to the manufacturer. Each manufacturer signs a declaration that the aircraft conforms to the standards applicable at the time the airworthiness certificate is granted. This grants the FAA permission to audit the producer's records at any time. In practice, the FAA audits compliance to the standards before granting an initial Certificate of Airworthiness for a new type. Shortened and less expensive development cycles mean manufacturers can iterate and improve their products much faster than traditional certificated aircraft producers, providing buyers with better and more up-to-date options.

INNOVATION

The contribution of LSA to general aviation is only beginning to be felt. With more than 130 aircraft designs now available, speed of innovation far surpasses that of traditional general aviation. Significantly shortened development cycles mean some designs are on their fourth iteration in only 10 years. The LSA development cycle is now on par with that in the automotive sector. Adopting new technologies (such as glass cockpits, night vision or new safety systems) is much easier for LSA manufacturers, providing better results for end-users. Testament to the success of the sector is the fact that Part 23's upcoming revision is standards-driven. The FAA and EASA expect to replace their Part 23 rules with ASTM International standards.

In the USA, the EAA and AOPA are on a drive to remove the Class III medical requirement for aircraft with no more than six seats used in non-commercial flying. Ten years of data from pilots operating with only sport pilot privileges conclusively shows that the incidence of airborne incapacitation is almost statistically identical to that of the wider pilot population. There is no statistical evidence that enforcing a medical on private flying makes it safer.

Design, production and certification standards harmonisation worldwide would significantly enhance prospects for light-sport manufacturers. A global standard would level barriers between markets and open up choices for buyers. Adopting the FAA's audit of conformance to standards rather than validation of standards significantly shortens development cycles and reduces total investment to economic levels. Pipistrel's chief executive, Ivo Boscarol puts it best: "We are waiting for the day to come, where LSA standards will be unified around the world, so we can focus on aircraft development and not their tailoring for each authority separately." ■



Gobosh markets its 700S as a luxury LSA

FULLY ROUNDED ROBIN

Boosted by the option of a turbo-diesel engine, the latest DR401 range of the classic touring aircraft offers pilots an impressive package of range and flyability



New Robin 400 production versions share the distinctive low set, cranked wing

PETER COLLINS ELSTREE

The Robin 400 design dates back to 1972, and well over 1,300 variants of the aircraft have been produced by the manufacturer at its factory in Darois, just northwest of Dijon in France.

The new Robin 400 production versions are now all designated DR401 and continue to share the same fuselage layout and dimensions

coupled with the distinctive Robin low set, cranked wing (of various wing chords and developed from an earlier Jodel design with wash-out on the outer wing sections). It also retains the same classic large, full cabin length, bubble-type canopy with a forward sliding front section for pilot and passenger entry. All DR401 versions have a fixed, faired tricycle gear.

The DR401 range features four different petrol (avgas) types. However, since 2014, that

engine range has been supplemented by the DR401 CDI type: a two-litre turbo-diesel engine (using Jet A-1 fuel) and rated at 135bhp (2.0 version) or 155 bhp (2.0S version).

The diesel engine used on the DR401 is based on a design originally produced by Thielert Aircraft Engines. Thielert went into bankruptcy and was bought by Continental Motors (US) in July 2013. Continental Motors had itself been sold to the China-based AVIC



» International in December 2010. The two diesel engine versions on the DR401 are now marketed as Continental “Centurion” engines.

The vision to equip the DR401 range with turbo-diesel engines was, to a large part, driven by an individual: Steve Bailey, the owner of Mistral Aviation and the sole UK distributor of Robin aircraft. Bailey lent his own DR401 (G-JSMH) to the Robin Company to facilitate the development programme for fitting the Centurion engines, which led to the issuing of an EASA Supplemental Type Certificate (STC) in 2014. Additional STCs for the DR401 now cover the Garmin digital avionics and the new Oratex paint-impregnated fabric wing covering – developed from German model aircraft technology – which eliminates the historical problem of surface cracking that is common in over-painted plain fabric.

The DR401 CDI 2.0 and CDI 2.0S versions, with the above STCs incorporated, are now

produced as a production standard by Robin. Additionally, with the standard upgraded engine exhaust fitted to meet stringent German noise regulations, it means that the DR401 CDI 2.0 and CDI 2.0S are also certified as glider tugs.

SPECIFICATION

The aircraft I would evaluate would be Mistral Aviation’s own DR401 CDI 2.0S, which is registered G-JSMH. The CDI 2.0 version is primarily aimed at flying schools, and the CDI 2.0S is marketed as a true four-seat touring aircraft.

The Continental CDI 2.0 and CDI 2.0S are both fuel-injected, water-cooled turbo-diesels using Jet A-1 fuel (now widely available at most general aviation airfields), using full authority digital engine control (FADEC) and requiring no mechanical back-up control. The engines drive a three-bladed, variable

pitch propeller produced by MT. It has no reverse pitch.

The true single power lever now automatically controls power and propeller pitch combined, and power is indicated to the pilot as a simple percentage. The FADEC removes the need to monitor and separately control boost, mixture, propeller RPM or carburettor heat at varying airspeeds, altitudes or outside air temperatures (OATs). The engine block of the Centurion is made from aluminium rather than the cast iron used in the original Thielert engines, which grants significant weight saving.

The digital avionics feature the two-screen Garmin G500 electronic flight information system (EFIS) on the left side of the instrument console, and the touch-screen Garmin GTN 750 navigation and radio display on the right side. The depth of the instrument console of the DR401 is not big enough to ac-



Owner Steve Bailey (left) and Collins with Mistral Aviation's own DR401 at Elstree

commodate the larger Garmin 1000-type displays. Two small standby digital displays for artificial horizon (AH) and altitude/airspeed separate the main display sides. The EFIS is supplemented by a two-axis S-Tec autopilot as well as a traffic collision avoidance system (TCAS), and ADF and DME navigation aid receivers. In this configuration the aircraft was fully EASA instrument flight rules (IFR)-certificated. The DR401 family has no anti-ice system.

Normal fuel capacity is 110 litres (29USgal), but G-JSMH was fitted with the optional long-range fuel tank that adds an extra 50 litres. With 160 litres of Jet A-1 grants the aircraft a still air maximum range of 850nm (1,570km), which allows for 7h of flight with 1h reserve. This is based on starting from the maximum take-off weight (MTOW) of 1,100kg when flying at 10,000ft/3,000m at 65% power, with 20 litres/hour of fuel con-



All Robins are made entirely from wood

Field of view from the cockpit was outstanding, with the canopy coming below elbow level at the side

sumption and an economical cruise speed of 111kt (206km/h) indicated air speed (IAS). The diesel engine can also be run at up to 100% power without time limitations. Mistral claims a cost saving in fuel of approximately £60 (\$92) per flight hour in comparison to an avgas-powered aircraft of similar configuration, and this reduction in direct operating costs represents a very significant saving to the owner/operator over the life of the aircraft.

Time between overhauls (TBO) of the engine is 1,200 flight hours/12 years, but Robin expects this TBO to be extended to 1,800 flight hours in 2015. Engine overhaul cost is £31,000. Propeller reduction gearbox time between exchange is 600h (as a replacement part swop-out) and a new gearbox unit cost is £4,000. These engine/gearbox costs must then be balanced against the significant savings made in fuel.

The MTOW of the DR401 CDI 2.0S is 1,100 kg. The basic operating weight (BOW = no fuel, cargo or pilot/passengers) of G-JSMH was 670kg, giving a useful load of 430kg. Two adults and two children at an assumed weight of 260kg, 40kg (maximum) of baggage and 130kg fuel (equalling the maximum long-range fuel of 160 litres) means that the aircraft

is a true four-seater, while at the same time retaining true maximum range.

The aircraft has conventional, unpowered flying controls with ailerons on the outboard wing section, an all-flying horizontal stabiliser with balance tab and electric trim, and two-stage electrically driven flaps (100kt deployment limit). The rudder is also electrically trimmed. Best angle of climb is obtained at 65kt and best rate of climb (700ft/min at MTOW) is at 75kt.

Take-off distance to clear a 15m obstacle is 492m (273m ground-roll) and landing distance over a 15m obstacle is 415m (175m ground roll). Typical rotate speed is 60kt with flap at setting 1, and typical final approach speed is 65kt with flap 2 into a 60kt flare. Maximum ceiling is 16,000ft; never-exceed airspeed (Vne) is 146kt; the maximum demonstrated crosswind is 22kt. The aircraft has no aerobatic or deliberate spinning capability.

The aerostructure (all Robins are made entirely from wood) has a warranty of 20 years and the Oratex wing fabric warranty is 10 years. The new price for the DR401 CDI 2.0S in its basic version is €203,500 (\$228,000), but at the upgraded, full-specification production standard represented by G-JSMH, including a full leather interior, the quoted new price is €325,000.

EVALUATION

The evaluation was flown from Elstree Aerodrome (EGTR) using runway 26 (tarmac). Wind was 300/10 gusting 15kt, OAT +6°C, and visibility was greater than 10km. Aircraft

FLIGHT TEST

» all up weight (AUW) with three adults and 80 litres of fuel was approximately 970kg.

The first noticeable thing about the DR401 CDI from the outside was the incredibly smooth fuselage surface that replicates carbonfibre in its finish. Entry to the cockpit can be made from either side, with passenger entry to the rear cockpit facilitated by folding the backs of the front seats forward. The baggage compartment, accessed on the left-hand side of the aircraft, was not voluminous but looked as if it had space for two medium-sized holdalls.

Field of view from the cockpit was outstanding, with the canopy coming below elbow level at the side. With the EFIS console, the single 'tee handle' shaped power lever and the central, dual control columns, the cockpit felt wonderfully uncluttered.

CHECKS

Pre-start checks were minimal and the key start was identical to that of a car, with no need for priming or mixture lever gymnastics. The FADEC integrity check was the essential element post-start. Ground-handling was precise, with nosewheel steering allied to excellent brakes.

Prior to take-off the aircraft was held on the brakes momentarily at 100% power to check that the propeller reached and stabilised at 2,300rpm. Take-off acceleration with the variable-pitch propeller was noticeably faster than with a fixed prop.

After rotate, and in chase with the photo ship, the controls felt light and well harmonised. The electric flap travel is designed to be slow (approximately 10s from flap 2 to up and 4s from flap 1 to up) so there were virtually no out-of-trim forces felt as the flaps were moved in either up or down. Control breakout and freeplay were small but centring laterally was not that strong. However, this was not a distracting feature.

No adverse yaw was discernible and the aircraft exhibited no Dutch-roll tendency. Roll rate at full lateral deflection was typical of a GA-type aircraft at around 40-45°/s. The aircraft rolled moderately with rudder and, at 75kt, a steady heading sideslip showed it could generate 25°+ of sideslip for a kick-off-drift crosswind landing. A 60°/2g level turn at 120kt showed no wing buffet.

Longitudinal stability away from trim speed was distinct but moderate in force and quickly negated by the pitch trim. The control column "stick top" was my only dislike. It

Without doubt I believe the future of modern GA aircraft now lies with the economy of diesel engines



What the Robin lacks in speed, it makes up for in range, comfort and field of view



Over 1,300 variants have been built in Darois



Recessed buttons were not always easy to feel



The aircraft's digital avionics are from Garmin



Mistral claims the diesel engine offers a cost saving in fuel of approximately £60 per flight hour

had two prominent buttons: red for autopilot disconnect and black for autopilot control steering, but then had five very small and recessed buttons: one black radio transmit button and four grey ones for pitch trim (up/down) and rudder trim (left/right). These recessed buttons were not always easy to feel and I would have preferred them to be more prominent.

At 75% power and 2,000ft altitude in level flight, the aircraft stabilised at 118 KIAS (knots indicated airspeed). The combined engine instrument does not show fuel flow. The aircraft was placed into a slight dive and at 140kt the control forces, while slightly heavier in pitch and roll, remained light and perfectly acceptable.

Two level stalls with idle power and flap 2 gave a stall-warning horn at 55kt and a defined nose drop at 46kt. Each stall was accompanied by a very small left wing drop but that may have been in part generated by me not having ensured perfect trim in yaw.

In formation around the photo ship I worked the engine/propeller combination hard, but the power response always remained smooth, rapid and effective. In the cruise at 2,000ft, the AP functions were easy to manage, the level ride was very comfortable and the superb field of view continued to delight me.

On recovery to Elstree, three visual circuits were flown in gusty crosswind conditions. The variable pitch propeller allows for speed to be shed quickly if fast on approach. In the gusty conditions the aircraft felt stable and I elected for a decelerating approach from 90kt into a 65kt flare. Precise touchdowns to the selected touchdown point were easy to make while still coping with kicking off drift in the crosswind. The DR401 CDI retains the Robin's trademark short take-off and landing (STOL) capabilities.

CONCLUSION

Without doubt I believe the future of modern GA aircraft now lies with the economy of diesel engines; the efficiency of variable pitch propellers; the flyability granted by FADEC; and the survivability afforded by EFIS when flying in and through increasingly complex GPS-based airspace. The Robin DR401 CDI now has these options in place, certified and combined into an impressive package.

The aircraft, with its fixed gear, is not particularly fast, but its STOL ability on to grass surfaces, allied to its very long maximum range with four people on board, gives it some significant advantages over its closest rivals.

The final part in the equation is cost. No new GA aircraft, at this level of specification, is cheap, and especially so in comparison with pre-owned aircraft. However, the new Robin DR401 CDI 2.0S is a superb touring aircraft and one that I would be proud to own. ■

STEPHEN TRIMBLE WASHINGTON DC

Five years ago, the US Federal Aviation Administration set a very ambitious goal. By 31 December 2019, any pilot operating in controlled airspace would be required to use a system compliant with the automatic dependent surveillance-broadcast (ADS-B Out) mandate to continuously transmit an aircraft's identity and precise position.

Even when the mandate was adopted in 2010, the 10-year deadline to equip all of the tens of thousands of commercial aircraft now operating in the system seemed ambitious. An even greater challenge, however, would be converting a large percentage of the general aviation fleet to become compliant.

Of the more than 200,000 aircraft in the US GA fleet, at least 150,000 aircraft owners would be required to spend thousands of dollars buying new ADS-B Out-compatible equipment. With more than 80,000 aircraft listed on the FAA registry valued below \$40,000, the cost of compliance – usually more than \$6,000, including a GPS wide area augmentation system (WAAS)-capable microchip – seemed too heavy a burden for most aircraft owners.

CONCERNS

Compounding the cost issue are widespread doubts regarding the FAA's ability to execute the mandate.

Commercial aircraft operators remember previous air traffic modernisation programmes that were cancelled by the FAA, leaving early adopters of the new technology with a large bill and useless equipment.

Not surprisingly, only 9% of the community of GA aircraft owners had acquired ADS-B Out compatible equipment by January 2015, according to the NextGen GA Fund. That means more than 100,000 GA owners must purchase and install the necessary systems in less than five years, stretching the capacity of avionics and repair station suppliers to meet the potential demand.

TRYING TO CONNECT

With most general aviation aircraft owners still to upgrade to ADS-B Out-compliant equipment, manufacturers have the systems ready but supplier capacity will be stretched



L-3 offers four major products in its Lynx family

The ADS-B Out mandate continues to present challenges, but there are new signs of hope as new low-cost equipment enters the market, along with new financing options.

The unveiling in February of the L-3 Aviation Products Lynx family of ADS-B Out-compliant transceivers and surveillance systems marks a key step in the transition of both the industry and the financing sector.

L-3 first "teased" the Lynx family of products last July as a low-cost compliance option for light aircraft and helicopters, with a stated goal of offering a low-end system costing \$2,000.

The details of the Lynx system revealed in February covered four major products – the NGT-1000, NGT-2000, NGT-2500 and NGT-9000. The first three include a compliant GPS WAAS receiver and operate on the 978MHz universal access transceiver frequency, an option in US airspace for aircraft that operate below 18,000ft.

The high-end product is the NGT-9000, a \$6,800 kit plus installation, which adds a 1,090MHz extended squitter transponder, and a touch-screen display showing weather and traffic.

For L-3 Aviation Products, the star of the portfolio is expected to be the NGT-9000, as a high-end option that is still priced low enough to attract volume orders.

But the breakthrough for the GA community is the capability offered by the NGT-1000.

Piper offers ADS-B In and Out functionality through the optional Garmin GTS 825 traffic advisory system on its new Meridian M500



For the first time, a manufacturer is offering a no-frills ADS-B Out compliance option priced under \$2,000.

Perhaps more importantly, a public-private partnership called the NextGen GA Fund has stepped in to make the system even more affordable for a group of 10,000 early adopters.

JUMPSTART

As L-3 Aviation Products was teasing the Lynx in July 2014 at the EAA Airventure show in Oshkosh, Wisconsin, the NextGen GA Fund had quietly launched a new initiative called Jumpstart GA 2020.

That initiative solicited bids for a volume purchase of 10,000 ADS-B Out-compliant systems. Of five bids submitted, the L-3 bid, based on the Lynx, offered the lowest price at \$1,599 per system, plus a \$1,000 installation fee and a \$500 GPS antenna, according to the NextGen GA Fund.

The NextGen GA Fund was originally established to provide low-cost financing options using government-backed loans authorised by Congress in 2012. The FAA and the Department of Transportation, however, have not yet authorised the loan guarantees.



Despite that delay, the NextGen GA Fund is continuing to offer financing packages to aircraft owners. The next step for the group is to extend the volume purchase concept.

After buying 10,000 NGT-1000 systems with 978MHz transceivers, the Jumpstart GA 2020 group is now soliciting for a volume buy of the same number of systems with 1,090MHz transponders.

That fits into L-3 Aviation Products' long-term strategy for the high-end NGT-9000. When the FAA adopted the ADS-B Out mandate in 2020, it was expected that avionics companies would develop products to meet the demand. It has taken five years, but the mandate is also starting to inspire new products that take a broader view than strictly ADS-B Out compliance.

VALUABLE

"I think that that unit – the NGT-9000 – even if there wasn't a mandate today, I think we will sell a lot when the price comes out and people will see what they can get," says Todd Scholten, chief pilot for L-3 Aviation Products.

Of the thousands of aircraft that have not yet equipped, L-3 Aviation Products has

"There are not enough shops to meet the demand if everybody started today"

TODD SCHOLTEN

Chief pilot, L-3 Aviation Products

targeted a group of older GA aircraft that lack multifunction displays to show data such as weather and traffic. In some ways, the value offered by equipping has eroded since 2010, as the Apple iPad – which was introduced the same year – has provided pilots with a carry-on device loaded with useful applications. With the NGT-9000, L-3 Aviation Products is offering an opportunity to consolidate that information on an installed display, while also making the aircraft ADS-B Out compliant almost as a bonus.

"You get a really good-quality transponder, and it's touch-screen," says Scholten. "If you didn't have an MFD in the airplane, now you've got some data that's really useful for you."

The NGT-9000 will display all NOTAMs, METARs, L-3's traffic avoidance system and ground radar. "There's a lot of value there,"

adds Scholten. "Sure, what prompted it was the mandate. But there's a lot of value to the pilot. We'll be competitive to what a Mode S transponder costs today."

By contrast, the NGT-1000 solution offered by the NextGen GA Fund is the simplest means of achieving compliance with the ADS-B Out mandate.

It is aimed at pilots who already use iPad applications for displaying airport maps, NOTAMs and weather, but need a transponder with an embedded GPS WAAS locator to be compliant with the FAA's rule. The system is mostly useless outside of the USA, except for some aircraft owners in Canada or Mexico who operate in US airspace on the 978MHz frequency.

"The market is enough that if we got even 20% of that market we would be doing really well," Scholten says. "The big issue is there are not enough shops to meet the demand if everybody started today."

"A lot of people are going to wait, too, to the end. A lot of people are waiting because they think there might be a change in the rule. A lot of people are waiting because they don't want to spend the money." ■

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A view of the vanished Sun

According to a release from EasyJet, passengers flying to Iceland from the UK on 20 March enjoyed a “front row seat for one of the most spectacular natural phenomenon’s [sic] – a total solar eclipse”.

The views over the Faroe Islands were said to have been truly spectacular (right).

Ignoring the greengrocer’s apostrophe and wrong use of plural on phenomenon’s, we wondered how the budget carrier had found a way to offer all passengers on an A320 a front row seat. Great pic, though.



Trick of the light: the total eclipse from EasyJet

Golden voice

Congratulations to Sean Maffett – voice of numerous air shows, including RIAT for 28 years – for having been awarded with the chairman’s award by the European Airshow Council. Maffett was praised for the “expression, enthusiasm, content and preparation” of his commentaries, as well as his “golden voice”.

Lateral stinking

Distressing story about the 17 March British Airways flight that turned back because of an overpowering stink from one of the lavatories.

If a picture used to illustrate the story by ITV.com is anything

to go by, a shortage of fuel and a faulty navigation system may have been contributing factors, too. The caption reads: “The Dubai-bound flight was forced to return to Heathrow airport half an hour after take-off” ... under a picture of a BA Airbus A319 landing at...er...Dublin.

In praise of U-2

As we near the 60th anniversary of the Lockheed U-2’s first flight, aviation author and long-term aficionado Chris Pocock has released a new tome: *Dragon Lady Today – The Continuing Story of the U-2 Spyplane*.

“Take a proven airframe, with years of life remaining, and add the very best sensors and communication gear. Give it to a



The iconic spyplane

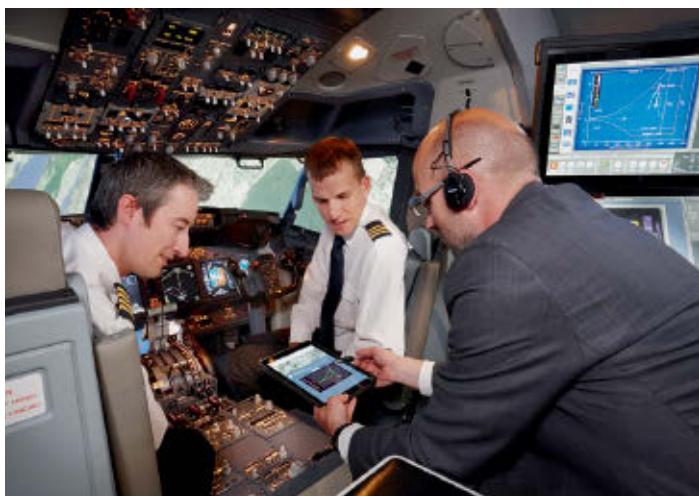
highly skilled pilot, and provide good support from a dedicated team. No wonder the U-2 remains the most advanced reconnaissance aircraft in the world,” he writes.

Boasting 190 images, the 102-page book is available in the USA via createspace.com/4969895 or from amazon.com.

Unusual attitude

“I couldn’t help but chuckle at the photo (left) in your 3-9 March issue, regarding EASA rule-making,” writes Mark Scott.

“The pilots in the simulator seem quite relaxed, and keenly listening to the instructor’s debrief. I then noticed the attitude of the aircraft, which seems paused in some kind of mid-air, death-defying aerobatic. I can only imagine the instructor is saying: ‘Let’s try that again, only let’s make it more like an ILS and less like a barrel roll.’”



Ready to race

Since giving a description of some of the seaplanes

100 YEARS AGO

entered for the Warnemünde-Scandinavia Seaplane Race,

which was postponed on account of the war, the following particulars are to hand of another machine designed specially for this contest – the BFW seaplane.

Military luxury

The US Maritime Commission is calling tenders for the

75 YEARS AGO

construction of two luxury liners which are capable of conversion into

aircraft carriers. Speed is stated to be 24 knots and they are intended for operation in the Pacific.

Oxford education

A series of special ground-school courses to prepare ex-

50 YEARS AGO

Service and other experienced pilots for their MoA and ARB commercial

pilot’s licence examinations has been started by the Oxford Air Training School. The course lasts five weeks and the response so far has been considerable.

Bizjet business

Gulfstream Aerospace is studying the market for a new

25 YEARS AGO

business jet between the top-of-the-range GIV and the middle

class of eight-to-nine-seat aircraft. If launched, it will compete with the Dassault Falcon 2000, Canadair Challenger S and British Aerospace BAe 1000. None of the aircraft is yet flying.

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Double standard of US carriers

I agree with Rev Smith (*Flight International*, 10-16 March) that the world doesn't owe the US legacy carriers a living and that many customers' preference for Emirates and its Gulf peers is mainly down to them offering a superior service in all classes.

However, there are other factors that undermine the legacy carriers' credibility. Chief among these are a lack of even-handedness. The US legacy carriers complain about the alleged explicit and implicit subsidies the Gulf carriers allegedly received from their governments, but fail to mention that they and some of their overseas alliance partners were the recipients of numerous forms of market-distorting direct and indirect government handouts.

All the US legacy carriers benefited from Chapter 11. This allowed them to walk away from debts and offload their pension liabilities to the US taxpayer.

There were numerous attempts by US legacy carriers to "unlevel" the playing field, including American Airlines using

COCKPITS

As dense as a tropical forest

I fully agree with Richard Lloyd (*Flight International*, 20-26 January).

As an airline Embraer 170/190 captain, here is an example of something I consider to be really stupidly designed: the type Flight Guidance Panel (FGP), which is the most important operational pilot/aircraft interface, and has no fewer than 41 pushbuttons or knobs, individual for each pilot or to be shared by both. It is as dense as a tropical forest, making flight function selection errors easy.

Even stranger: if you mistakenly punch the heading mode (HDG) twice, you've got a roll (ROLL) mode message on the flight monitor annunciator instead of heading.

If you do so with the flight level change (FLCH) mode, it delivers flight path angle (FPA) mode!

It means that if crew suffers stressful flight conditions (weather, ATC, technical flaw) the automation doesn't help. In fact it increases workload at critical flight phases, perhaps leading to loss of situational awareness if crew are distracted from thoroughly checking the mode obtained to ensure it is the mode intended.

But the most amazing thing is that this poor ergonomic design in a crucial control interface passed successfully through the certification process.

Cyril Lutran

Morbecque, France



Automation can add workload

its influence with politicians to successfully lobby for the amendment that limited Southwest's growth at Dallas Love Field for over three decades and Continental/United's unsuccessful attempt to prevent Southwest introducing international flights from Houston Hobby.

The most recent example is the attempt led by US legacy carriers and the unions representing most of their workers to persuade the US government to refuse granting Norwegian's lower cost Irish subsidiary a foreign carrier permit that will enable it to fly to the USA from EU/EEA countries other than Ireland.

Last but not least, is the "Fly

America" rule that compels all US federal government air travel to be with US carriers

So it seems that all this US legacy carrier talk of "fair competition" is really code for old-fashioned protectionism.

Krishnan R Iyengar

*Aviation analyst
Crawley, UK*

ETOPS clue to missing MH370

If correct, my opinion on the disappearance of MH370 would mean abandoning ETOPS, which would be unthinkable to airlines, governments and manufacturers.

I think MH370 had an uncon-

tained engine failure similar to the Qantas A380 – in which the turbine disc passed through the wing. But on MH370 this penetrated the cabin on the Boeing 777-200ER, which caused a loss of pressurisation.

In order to maintain a cabin altitude at which passengers could breathe after emergency oxygen had run out, the captain would have had to descend below 10,000ft. This would have caused so much drag that the aircraft wouldn't have had enough fuel to fly at an equivalent cruise speed – as it would at its normal cruise altitude – for 4h, to reach a runway it could land on.

This is the reason for the captain's 180° turn over the Gulf of Thailand. The crew were heading back to the nearest runway at Kuala Lumpur, from which they had recently taken off, but due to the extra drag below 10,000ft, ran out of fuel.

I think the crew were probably too busy trying to maintain the aircraft's systems with one engine and the emergency ram air turbine to make a Mayday radio call. The unregulated intermittently switching power sources could cause spurious position data to be sent to the Inmarsat, leading Inmarsat operators to believe the aircraft had flown beyond Indonesia and continued on to the southern Indian ocean, an inconceivable course of action for the crew of a stricken aircraft.

Therefore I think the search effort is looking in the wrong place. They should be looking in the Gulf of Thailand on a line from the captain's U-turn. The reasoning behind not pursuing this logical course of action is because the aviation community has too much invested in ETOPS.

Tim Seabrook

Market Drayton, UK



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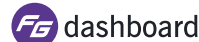
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EVENTS

20-21 April

ISR conference
Holiday Inn Regent's Park, London
isrconference.com

20-23 April

AeroDef Manufacturing
Hilton Anatole, Dallas
aerodefevent.com

24 April

Skytech
Business Design Centre, London
skytechevent.com

29-30 April

Loyalty@Freddie Awards
Atlanta, USA
flightglobalevents.com/
loyaltyfreddies2015

1-3 May

Drones, Data X conference
Santa Cruz, California
nua.io

4-7 May

AUVSI's Unmanned Systems
Atlanta, USA
auvsishow.org

10-11 May

Aviation Africa
Dubai, UAE
aviationafrica.aero

13-14 May

Ascend Asia: Finance Forum
Singapore
flightglobalevents.com/ascendasia2015

17-20 May

ALTA CCMA
Punta Cana, Dominican Republic
alta.aero/ccma

19-21 May

EBACE
Geneva, Switzerland
ebace.aero/2015

26-28 May

AP&M Europe
Olympia London, UK
apmexpo.com

31 May - 3 June

**1st International Symposium on
Sustainable Aviation (ISSA)**
Istanbul, Turkey
issasci.org

4-6 June

France Air Expo
Lyon-Bron airport, France
franceairexpo.com

15-21 June

Paris Air Show
Le Bourget, Paris
siae.fr

30 June

Ascend Europe: Finance Forum
London
flightglobalevents.com/
ascendeurope2015

17-19 July

Royal International Air Tattoo
RAF Fairford, Gloucestershire, UK
airtattoo.com

18-20 September

Midden-Zeeland airport fly-in
Arnhem, The Netherlands
neeland-airport.nl



For a full list of events see
flightglobal.com/events

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- Epping Forest District Council, as landowner, is seeking an experienced partner to implement a growth strategy for the airfield to increase profitability through managed investment, intensification and redevelopment

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CIVIL AVIATION AUTHORITY

Service providers qualification for SLOT management tender

Qatar civil Aviation Authority is seeking the services of specialized qualified well experienced companies / agencies that can provide the following services:

- Determining the SLOTS capacity at Hamad International Airport (HIA).
- Managing/coordinating SLOTS at the airport whereas HIA airport now is declared as Level 2 Airport, and in-light with the increase of traffic there is a high possibility for shifting to Level 3.



N.B. expected capacity between 225,000 to 230,000 movements annually (to be determined accurately by the service provider)

Qatar Civil Aviation Authority requires interested qualified service providers to send their qualifications, past experience, and references by mail to:

Qatar Civil Aviation Authority,
Public Relations & Communications Department
P.O. Box 3000 Doha, Qatar.

And by E-mail to **pr@caa.gov.qa**

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RECRUITMENT

Senior General Manager, Airports – Astana, Kazakhstan



General Role Description:

The **Senior General Manager, Airports** will report to the Director, Ground Services and will manage all administrative and operational functions of airports including:

- All airport operations, own and subcontracted services
- IATA SGHA and SLAs
- Handling processes and customer services (pax, ramp, cargo)
- Staff development: recruit, train and mentor local talents
- Ability to plan and manage departmental annual budget
- Develop and supervise different projects

Personal Requirements:

- Tertiary Education (University degree) with a minimum of 10 years management experience and overall 20 years of airline/airports experience.
- Very good written and spoken English
- Strong leadership qualities and people skills
- Team player
- Must be hands-on
- Highly motivated self starter who can work in a culturally different environment
- Very good negotiation skills

Job Requirements:

The Job will require knowledge and experience in the following areas:

- Previous Experience in running the Ground Services Operations of an Airline or a Ground Services Handling Agent Operations
- IATA AHM, SGHA and SLAs. Aircraft handling and process management
- Experience in ISAGO / IOSA
- Financial experience in setting and managing budgets
- Knowledge of SMS
- EU Ops documentation and structure
- Experience in hub management is an advantage

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A320 CAPTAIN

Applicants must meet the following minimum requirements:

- Possess a valid ICAO, FAA or JAA ATPL license
- Holds A320 type rating
- Minimum 4,000 hours total flight time with 2000 above hours on Turbo-jet and at least 1000 hours in command on type



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WORK EXPERIENCE ROBERT WILLS

A business where time is money

An engineer by trade, Robert Wills is the owner and founder of Canada's Airstart. The company supplies spare parts for the world's commercial airlines, MRO and leasing firms – and a quick turnaround is critical for all

Have you always been interested in aviation?

Ever since I can remember, I played with airplanes, built models of airplanes, flew and usually crashed said models. I was that kid that should have been on the soccer field on Sunday mornings, but was at the local airport with my dad spotting and filming the McDonnell Douglas DC-8s, Boeing 707s and Lockheed Tristars.

Tell us about your career

I had always wanted to be a pilot, but I grew up in the middle of the first oil crisis, and common sense took over. "Why be a pilot?" I said to myself. "There won't be airplanes in 30 years, as there won't be jet fuel in 30 years. Pick a job that will pay the mortgage." So I went to school to become a professional engineer and had a relatively gratifying career designing highways, urban systems and airports. Not long after that I decided to get my private pilot licence, fell in love with flying, and left my job as an engineer to become a bush pilot in Northern Canada. I did that for several years. On a ski vacation I ran into a Cathay Pacific 747 pilot at the pub at the bottom of the mountain. He convinced me to apply to Cathay, saying my flying experience and training as a professional engineer was just what they were looking for! Well into the application process they told me I was three months too old to be considered as a pilot. That was my cue to try to stay in aviation but perhaps not as a pilot.



The cost of grounding an aircraft can be huge, so every second counts

After moving around in management at FedEx, I founded Airstart in 2000 and we now proudly support over 75 airlines, maintenance, repair and overhaul and leasing companies.

How do you remain competitive in such a crowded market?

In a recent survey, our customers said they were impressed with how quickly Airstart responds to their queries, whether they require a component for a grounded aircraft, status on an order, request for an expedited turnaround time for a critical component, or just simple information or perhaps a referral to another service provider. The aviation industry is unique in that every second counts. The total cost of a grounded aircraft can be in the hundreds of thousands of dollars per day for an airline, so there is no messing around and no time to mull

things over during a coffee break. When I started the company, Airstart was the only company that I was aware of that used a system on smart phones for instant replies to its customer base – regardless of the time, day or night. During our early days I was able to master the art of waking up on the first ring of our AOG [aircraft on ground] mobile phone and sound wide awake at 3:00am. In addition, our inventory is excellent. We stock practically every in-demand part for the fleets we support, and due to our forward stocking locations, the part can be delivered in hours, sometimes minutes, to locations around the world.

What does a typical day involve?

I would love to say "my day starts when..." and "ends with" but in this industry calendars and clocks melt into one another and you find yourself immersed in avia-

tion from the moment you wake until the moment you drift off, always in discussions, email, BBM, Whatsapp, whether in the boardroom or at the dinner table. Typical days involve a healthy dose of routine, combined with new customer pitches for component support, marketing updates (we display and attend roughly 10 trade shows per year – each with a different theme), pricing strategy sessions, and always inventor acquisition meetings, daily – whether it be bidding on an aircraft for leasing or part-out – or purchasing the rotatable /consumable inventory from an airline that has just changed fleets or liquidated. I try to stay fit by engaging in Canada's national pastime – ice hockey.

What are the most enjoyable aspects of your job?

For sure, being able to interact with hundreds of people every month that share one common passion – everything aviation.

The least?

This is an all-consuming business we work in and it is difficult to disengage. On more than one occasion I have dropped my BlackBerry from a ski lift while on vacation with my family. Work-life balance can sometimes be a mirage. ■



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